

Docket No. SA-537

Exhibit No. 6-J

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C.

Attachment 9 – Emergency Response Interview Summaries

(97 Pages)

Interview: Mr. Henry Choy, Airport Safety Officer, San Francisco International Airport (Operations Division)
Date/Time: 11 July 2013, 1048-1204
Location: Administrative Conference Room, Terminal 2, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA), Kathryn Reneau (FAA), Capt. Terry Smerdel (SFFD)

Airfield Safety Officer (ASO) Choy had 20 years of service at San Francisco International Airport, the last 6 years as an ASO. He was doing his normal patrol when he heard an Alert 3 that an airplane had crashed on runway 28L. He was at the south end of the airport at taxiway M and runway 1L. He looked back as he was driving southbound and saw black smoke. He heard the "201" call indicating that the airport was closed.

When he approached the scene he observed that both slide/rafts (1L and 2L) were deployed and passengers were evacuating. He did not observe the other doors. He parked a distance away from the airplane (north of taxiway F by taxiway P) so the first responders would have plenty of room. He parked his truck and then directed passengers toward it. He was trying to get them clear of the airplane and helped carry injured passengers away from the airplane. He used his truck as a rally point, directing passengers toward taxiway P. He primarily used hand signals to direct passengers because he knew it was a Korean flight and he thought there might be a language barrier.

He saw fuel leaking from the left wing when he got on the scene. He saw a high pressure fuel leak, a big spray of fuel that suddenly came off of the wing. He was worried because he knew that jet fuel burns faster as a mist. He assisted people getting off of the slide/rafts because they were getting "piled up." Some were injured; the majority were ambulatory but holding their stomach or side. Some were being assisted by other passengers. A lot of passengers were helping each other. Crewmembers were standing in doors of the airplane directing passengers off. He did not recall hearing the commands shouted by the flight attendants but he saw them at the doors clearly directing people off of the airplane. He noticed 30-40% of the passengers had bags when they were evacuating - mostly smaller carryon bags, not roll-aboards.

A grass fire had started at the front of the airplane under the belly. He radioed Fire Control to alert ARFF about a fire under the nose of the airplane. The first ARFF truck was spraying on the fire so he pointed at the fire under the belly and the truck parked at the nose applied agent from its bumper turret. Right after observing the fire he saw a male cabin crewmember at the 2L door screaming for help, saying that he needed a sharp object. From the bottom of the 2L slide/raft ASO Choy could see a slide/raft inflated inside the airplane that reached from the floor to the ceiling, at the corner of the galley. He saw Lt. Emmons (SFFD) standing nearby and asked her for a sharp object but she did not have one. She was wearing her oxygen bottle but said she could not go on the airplane because she did not have any water. Lt. Emmons said, "We're not going in without water." ASO Choy asked the ARFF driver if they had a knife and they also said no. There were two trucks present, one hose truck and one with water. Officers Cunningham and Lee arrived just after Lt. Emmons had said she could not help. Officer Cunningham had a

knife and gave it to Officer Lee. ASO Choy and Officer Lee ran up the 2L slide/raft. At the top of the slide/raft the male flight attendant took the knife. As they stepped into the airplane the flight attendant said that the slide had already been popped. He recalled hearing it pop.

The smoke was getting bad on the airplane. The last three flight attendants came off and he helped carry the one who was badly injured. He recalled that the three flight crewmembers went down the 2L slide/raft. It was at this time he saw what he later realized was a body lying on the ground. It was very dusty and he did not realize it was a real person at the time. There was no blood around the body and there was no movement. It looked more like a "big doll." There were no obvious injuries, and the hair was all "spikey." It was lying on its side with its hands together. There was no blanket over it at the time. He did not find out it was a real person until more than a day later.

He noticed that a triage area had been set up on taxiway F, just abeam the airplane. He heard on the radio that the airplane was fully evacuated. He went back to the airplane to confirm that it was clear and he suddenly saw a man come down the slide/raft with his laptop bag. He was really startled to see the man come down the 2L slide/raft. He thought that the man might have gone back into the airplane through the back just to get his laptop. He was advised by the flight crew that the airplane was all clear and he radioed that information to control. He took the crewmembers close to triage and dropped them off. At this point the people that had been by his truck had shifted to the triage area.

On the radio he heard a call from another ASO for assistance due to multiple critical injuries to the east of the airplane. He broke away and got his truck. He looked for EMS and asked for their assistance. He saw a fire/rescue paramedic on a fire vehicle (he believed the vehicle was from the City of Millbrae) nearby and asked them to help. They told him they would have to radio the incident commander to be released to help. Initially the incident commander said no one could go. However, when he told the incident commander about the two critical people, and that no EMS personnel were on the east end of the airfield, he finally released them. He escorted an EMS truck with four paramedics out on the runway. He asked if they could be split up to help more people, but they did not want to split up, so he left them with ASO Magana.

He proceeded to the north side of the runway to meet with ASO Batkowski who was with one of the deceased passengers. Two SFFD EMS vehicles arrived. The paramedics got out of their vehicles and started triage. Some passengers were complaining about how long it took for them to get there. Some passengers were "cussing up a storm." They eventually loaded three people but the two drivers had "disappeared" so the vehicles could not leave. It took some time but he finally found the two drivers. Ambulances arrived escorted by ASO Crane. He took over the escort from ASO Crane and took them off the airport operations area (AOA) via the North Field Checkpoint. There was a string of mutual aid vehicles at the checkpoint that needed to be escorted to the staging area. He took them to Plot 40 in front of Fire Station 2 and staged them there. He then returned to the accident site and assisted other injured people.

He transported three injured people off of the runway in the cab of his ASO truck. He helped the passengers off his truck at triage and then went back to the North Field Checkpoint and escorted mutual aid vehicles to the staging area in front of Fire Station 2. He returned to the crash site in

a convoy escorting mutual aid vehicles, with Customs and Border Patrol bringing up the rear. Buses at the site were being loaded with passengers and he took them to Gate 91. He escorted a lot of buses back and forth. He saw a helicopter land on runway 28L. After the helicopter landed he escorted one SFFD ambulance (with two patients) to the helicopter for transport. There were a lot of escorts on and off the field.

He helped escort a United 747 back to the terminal. The passengers had been stuck on the 747 airplane for three or more hours. The 747 pilot said that he had seen the whole landing and offered to give a statement. Officer Choy got his contact information. He continued to help with escorts and then later inspected runway 1L/19R runway and advised operations that it could be opened at 1552. He stated he put cones on taxiway L short of 1R to ensure no one would cross over an active runway. He continued doing random escorts.

When asked if he had any recommendations based on this experience he said more paramedics would have been helpful and that the ladder trucks were not really helpful. He further stated that, when ASO Horne arrived with the mobile command post, the incident commander was not on the scene. He believed that the incident commander did not seem to know help was needed at the rear of the airplane. He heard it on the radio and took it upon himself to convey the information.

Interview: Mr. Alexis Esguerra, Airport Safety Officer, San Francisco International Airport (Operations Division)
Date/Time: 11 July 2013, 0933-1023
Location: Administrative Conference Room, Terminal 2, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA), Kathryn Reneau (FAA)

ASO Esguerra had 19 years of service at San Francisco International Airport, the last 9 years as an ASO. He was the runway/taxiway inspector that day and had earlier performed the runway inspection. He found no issues. He had just finished a safety briefing in the ASO office and was departing in his truck when he heard the alert tone indicating an accident by driving on taxiway D and making a left onto runway 10R. He spent about 30 seconds in shock and then went to the accident site. He made sure the runways and taxiways were closed. He radioed the tower to close them saying, "Tower 201 show field closed" and the controller acknowledged. Generally with the Alert 3 the airport would be closed, but he wanted to make sure. He transmitted on Channel 1 for operations staff. He first saw the accident scene when he went past the three water tanks located near Fire Station 2. He saw a dust cloud and smoke.

As he went past the VOR located between 10L/10R approached the scene he saw people moving away from the airplane to the east. He did not know there was another ASO on the left side of the airplane. When he approached closer he saw passengers moving away from the airplane on the left side, and also saw passengers congregating at the rear of the right side of the airplane. They appeared to be coming out of the tail. He went to the tail of the airplane because he could see people were walking toward a 747 that was stopped on taxiway F. He tried to use the truck's public address (P/A) system to rally people toward him, but the PA was not functional. He got out of the truck and used hand gestures and his voice to direct people. When he got out of the truck and yelled and waved his hands it worked better.

After a while he noticed people were having difficulty leaving the airplane. He went to the hole in the tail of the airplane but did not enter. He yelled for people to come out and emphasized to those who would not leave that they needed to get out. He helped 3-4 people leave the airplane. There was an older man, a middle-aged woman and two small children who were concerned about their parents on the plane. After the first three people he helped he saw ARFF vehicles swarming in. He got concerned about all of the people who were milling around. The fire trucks were constantly zipping around, jockeying for position. He saw 6 trucks, only 2 had booms up. The others seemed to be saying, "where do we go, where's the best place to put agent?" He saw mostly white smoke. The roof and forward part had been burned away. The aft section of the airplane was crushed but there was no visible fire.

He stayed with the older man because he seemed the most injured. He went back to the airplane and helped an elderly woman. He dragged her 50-60 feet away and then stopped because she could not take the pain. It was then that he first saw medics on scene. At one point he thought "Where the hell is EMS?" then the next moment they were lined up. He heard several minor explosions around the airplane. He thought to himself, "What the hell am I doing?" Once EMS

had the elderly woman he returned to the two children. The man and middle aged woman were gone, but the two children had been waiting for him. The little girl was hurt and could not walk so he piggybacked her around. He recalled seeing firefighters going in and out of the tail of the airplane. He assumed they were searching the airplane. He was not sure if they were airport firefighters or mutual aid.

After clearing the area he saw fire vehicles come around the rear and felt that a bad situation just got worse. He stepped up his efforts to get everyone clear. He returned to the older woman he had helped and she was immobile due to pain. He stayed with her until EMS arrived. He then returned to crowd control duties and assisted with transport of people, both injured and uninjured, to the triage area with his truck. By then there were plenty of mutual aid responders on the scene. He moved non-ambulatory passengers with the assistance of the police, using backboards. He picked up people primarily in the aft of the airplane. He picked up one group near the runway arrow markings (displaced threshold). Around 1230-1240 he noticed that the fire seemed to be out. He told his supervisor that things seemed to be in hand. He escorted a bus to Gate 91. He was directed to stay on scene at the gate and direct traffic. He volunteered to transport green/yellow triage passengers to the Reflection Room in the ASO's bus. While escorting the passengers from the bus to the elevator he saw airport employees attempting to take pictures and record the passengers with their cell phones, so he helped cordon off the area.

He did not recall seeing people evacuating the airplane after returning for the second group of passengers. He did recall seeing firefighters coming and going from the airplane. He did not recall seeing any non-ambulatory people in the area forward of the left wing. He said that he "pretty much stayed out of that area." His radio worked fine. He tuned it out at various points, but recalled hearing another ASO call for immediate help from an AMR ambulance for someone who was critically hurt on the runway. He had no idea what the fire department was doing, because they were on a different channel. He was communicating on Operations Channel 1.

There were 3 flight attendants with him in the area about 500 feet behind the airplane. They were not on the runway. Two of the flight attendants were fine and helped by translating for the passengers. He asked for help with the passengers because they were scattering. One of the flight attendants began shouting commands to the passengers in Korean. One flight attendant had a very bad head wound and was unresponsive. He thought her scalp had been peeled back.

ASO vehicles carry the following safety equipment: safety vest, leather gloves, hard hat, basic first aid kit, small fire extinguisher.

When asked if he had any recommendations based on this experience he said that ASOs should be trained in airplane evacuation and emergency procedures. He believed they needed training as first responders to better assist. He also felt that they should have basic firefighting equipment - this was the third time he had dealt with a fire on an airplane. He said that they are severely undertrained considering they will be first responders on the scene. At one point he was asked by EMS to assist with putting a collar on a patient but he had no idea what to do. It was very frustrating for him because he could not help and he felt he could have been much more effective if he had some sort of training. He felt the first aid equipment that was supplied in the operations vehicle was "a joke" in this situation. Finally, he stated that fire department might want to

analyze their response and that they should send staff to clear the area. They were all jockeying for position and looking at the fire, not at what was outside their vehicle.

Interview: Mr. Nicholas Bazarini, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 10 July 2013, 1634-1715
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Danny Gracia, San Francisco Firefighters Local 798
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA), Kathryn Reneau (FAA)

Firefighter Bazarini had 20 years of service with the SFFD, the last 13 at SFO. An Alert 3 came in from dispatch and said a 777 had crashed on runway 28L. He put on his gear and when he drove out of the bay of Fire Station 2 in Rescue 88 he saw smoke. He went as fast as he could go but did not hear the vehicle's tilt alarm on his way out.

When he pulled up to the site he could see fire and smoke at the right wing and there was a detached engine there. The fire appeared to be spreading under the nose of the airplane. Most of the passengers were exiting from the left side of the airplane, but he saw people on both sides. He recalled that door 1R was open when he arrived on scene, but there was no slide/raft. He took the 1 o'clock position and started discharging foam, forward to aft. He was trying to cool the fuselage and wing, and put the fire out. He was hitting the fire intermittently to make the agent last and also to assess the effect of each blast. The fire did not extinguish but changed its character - the smoke went white, and the flames abated. He tried to create a blanket of foam under the wing due to the risk of fuel leaking. He wanted to conserve the agent to cool the fuselage for the passengers instead of just dumping it all out. Firefighter Emmons got out of the truck immediately and went to assist on the ground. He continued dispensing until he ran out of water. He advised Lt. Monteverdi he was empty, then went and filled his tank at Fire Station 2.

When he returned a vehicle was at his previous position (1 o'clock) so he went to 3 o'clock. There was a lot of black smoke and it was very hard to see. He felt there were too many firefighters on the ground and he did not want to shoot because he could not see them. He could see some people running around on the ground. He did not feel like he could do much because he could not see and he was afraid of hitting someone with the spray. He advised Lt. Monteverdi that he needed to reposition and was directed to the 7 o'clock position. He went to 7 o'clock where he observed two victims on the ground and saw someone he believed to be a police officer kneeling next to one of them. He was too far away from the fire to hit anything, so he was advised to back up and protect the rear area in case anything developed back there. He told Lt. Monteverdi that he could not get into position and was told to move back.

The vehicle at 9 o'clock ran out of water and backed out. He heard on the radio that they were leaving and believed he advised Lt. Monteverdi he was moving into their position. Around this time the fuselage vented, and there were holes with flames when he got into the other vehicle's position. He wanted to get close to the airplane, but Chief Mark Johnson alerted him to the presence of a body on the ground. Chief Johnson opened the door of the rig and said "There is a body on the ground, you can't go this way." He asked Chief Johnson to direct him, and then got into position and dumped everything he had into the holes in the top of the fuselage. Prior to this time during the response he had not been assisted with positioning his vehicle. If he had not been advised of its presence he believed he definitely would have hit the body because he did not

see it at all. He would have gone closer to get the roof turret nozzle directly in the openings in the fuselage but he could not because of the body. He saw the body and it “didn’t look too good.” His recollection was that she had blonde hair. He saw them put a yellow blanket over the body. He stayed in position until he ran out of the water, and his foam indicator was flashing red.

He went back to Fire Station 2 and there were two vehicles at the hydrant. He went around the firehouse to the southwest corner of Super Bay. He used the 3-inch line there and filled the water tank by himself. He did not refill the foam because he felt it would take too long. He left the hose on the ground and went back to the site. On his return he pulled back into the 1 o’clock position. The fire seemed to be more or less out at this point. The other big rigs were using Snozzles and handlines. He sat in a protecting position until he was released from the scene at 2000 or 2100. He went back to the firehouse and was told, “Nice job, go get a drug test.” He went and got tested and got back around 0100. He was told he had to take a drug test because the body on the scene made it a potential accident scene. He gave a statement to the police who were investigating.

He explained that there were typically three people in Rescue 88 but there were only two at the time of the accident because the rider was out shopping for the fire station. The ARFF Oshkosh rig holds 3000 gallons of water and 450-500 gallons of foam. He refilled it twice. The foam gauge on the unit does not function and he has reported it a number of times. He did not usually get to shoot foam. When asked if he had any recommendations based on this experience he offered that he thought everything really went well considering the circumstances. He thought the quality of the foam blanket was good but he did not have anything to compare it to.

Interview: Ms. Christine Emmons, Lieutenant, San Francisco Fire Department
(Airport Division)
Date/Time: 10 July 2013, 1125-1250
Location: Fire Station 3, San Francisco International Airport
Representative: Dale Carnes, Assistant Deputy Chief, San Francisco Fire Department
(Airport Division)
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA),
Kathryn Reneau (FAA)

Lieutenant Emmons had 24 years of service with the SFFD, the last 10 at SFO. Lt. Emmons was assigned to Rescue 88 at Fire Station 2. She heard the alert tone from the FAA tower – a female dispatcher’s voice stated “Alert 3, Alert 3 – Plane crash, plane crash.” She knew from the dispatcher’s voice that it was an actual event and not a test. She donned her gear and waited for the driver to get in Rescue 88. The driver must get in first because he sat in the center and she sat on the left. Normally there were three people on the vehicle but one person was out shopping for the fire station.

They left the fire station and drove straight out because she did not initially hear the location of the crash, although it may have been announced. She was not sure if the driver heard the location either. She looked left and saw a large plume of black smoke. The driver made a hard left. The alarm sounded that the rig might tip, and she told him “We have to make it or we aren’t going to help anyone.” She had worked with the driver previously and had voiced concerns about his driving and the possibility of the rig tipping. They approached the parallel runways and saw Rescue 9. She looked right and saw a stopped airplane. She saw another airplane that appeared to be on a go around. She believed the runway had been closed but did not wait to confirm it. She said “Let’s go, we’re not asking.” They passed Rescue 9. They made other turns and the tip alarm kept going off. She kept telling the driver “we have to get there.”

As they got closer to the airplane she saw the largest amount of flame coming from the engine and the right side of the fuselage. They were the first fire vehicle on scene. She instructed the driver to take the 1 o’clock position for best access, and directed him “Engine, foam, fuselage.” She wanted to cool the fuselage for the passengers evacuating. They parked approximately 10 feet from the nose. They initially used the roof turret, then the bumper turret. They dispensed foam - no dry chemicals. She left the vehicle about 4 minutes after arrival. They had gotten a good “knock down,” and had taken the fire from free-burning to a knocked down stage. She did not recall if there were visible flames at that point. She went to the opposite side of the airplane, leaving the driver alone. She donned her helmet and her SCBA, and crossed between Rescue 88 and the nose of the airplane.

When she came around the airplane she saw people exiting out of door 1L. She felt happy because she knew the evacuation was taking place and that there were survivors. By the time she crossed over in front of the nose to the left side the evacuation had slowed. Door 1L was open and the slide/raft had a steep pitch. Door 2L’s slide/raft was not as steep but both appeared to have functioned properly. She saw a hump at the end of one of the slide/rafts, and watched an ambulatory woman struggle over the hump. She met up with Lt. Monteverdi (Engine 33) close to the 2L slide/raft. She told him she had called for a ladder. He acknowledged he heard the

information. Lt. Monteverdi's driver was positioning near the 2L slide/raft and she saw a person on the ground. She "immediately categorized it as a casualty." She identified the victim as a small person in the fetal position with a bob haircut. She saw that the body was covered with dirt that appeared to be the same color as the dust cloud from the airplane. The very small-statured female was not making any sounds and was not moving. She made a "3 second" visual assessment and thought, "that's our first casualty" and considered her as "DOA" – but she also wanted to make sure she was not rolled over by a vehicle.

Firefighter Kirk asked her, "can we go in?" She said "not without a line!" because she could see fuel running out of the wing near the fuselage. Lt. Monteverdi "bounded up" the 2L slide/raft. Firefighter Kirk pulled a handline and went up the center of the 2L slide/raft using a strap on the slide/raft. She saw one person in 2L doorway, a man with a bloody face saying "Come up here, come up!" She assumed the male at door 2L was not crew because he was male and she did not think that Asiana would have a male flight attendant. Other than that, she did not have any recollection of the flight attendants. She did not receive any information about flight attendants trapped by slide/rafts. She did recall receiving a radio call that four crewmembers were unaccounted for during the fire.

She followed Firefighter Kirk up the slide/raft, going up the left side. While going up she saw Firefighter Kirk knock the fire down which he said was in the galley. She saw the water, but not the fire. She did not see him signal for water. The line was open for approximately 10 seconds. Lt. Monteverdi was inside feeding line while she and Firefighter Kirk conducted the search on the left aisle. Lt. Monteverdi began a search pattern, going toward the right side of the airplane. She and Firefighter Kirk went down the left aisle. All of the seats in the forward cabin were upright, the aisle was straight. The front of the airplane was "pristine" and it was striking how clean the forward cabin was. It was very easy to search. After the 3L doorway/bulkhead the seats in the back section were twisted and some were piled up. The visibility was much better in the back.

As she walked down the airplane's cabin she saw some fire in the ceiling. As she got further from it, visibility improved. Firefighter Kirk asked to go ahead of the line to see what was ahead in the cabin. He notified her there were passengers in the rear. She got on the radio and said "Rescue 88, passengers trapped in the rear of the airplane." She got no response. She saw four people in the rear of the airplane. A person on the left aisle appeared to be trapped by "big overhead" debris. There was a large, elderly man in the center who was moaning. There was a woman who was trapped with a man standing over her who appeared to be waiting with her. She had not seen any passengers until after the 3L doorway/partition. The large, elderly man was in the center, another person trapped by overhead debris on the left side, and the couple (a man and a woman) was on the far right side of the airplane. Firefighter Kirk went to the trapped person on the right. She went to assist the couple. She encouraged the man to leave and he did. She did not see the hole at the back of the airplane at all. The aft of the airplane appeared "coned" and she did not realize that the back was gone. She saw Firefighters Phillips and Saxton on the right side. She also saw Firefighter Atwater, but she did not recall where. She saw a police officer and made eye contact. Conditions were initially clear enough to take her mask off. Conditions deteriorated and there was black smoke and the visibility began dropping. She told the police officer, "Let's get out of here." Backboards had appeared on the airplane, so she

loaded the woman on one and they carried her to the 4L door and removed her from the airplane. There were still people in the area milling around but they were not between her and where she was going. When she felt they were a safe distance away from the airplane they put her down. The large elderly man was pulled out of the 4L door as well. After getting him out of the airplane they put him on a backboard. He was moved to triage and was designated "red."

She was confident that the cabin had been cleared of passengers. She felt relieved that no one was left on the airplane. She turned around and saw that the fire had burned through the fuselage. She saw it as a fire now, not an accident scene. At this point the firefight was a defensive fight that was being handled by the big rigs, there would be no more entry into the airplane. Two big rigs were attacking the fire and they seemed to be struggling to get containment. The rigs were constantly repositioning. She remembered seeing the piercing nozzle from Rescue 10 attempt to pierce the plane, she was not sure it was successful. As the piercing nozzle was removed between the 2L and wing the shear pin broke and the piercing tip was hanging loose. She stated that "it's designed that way" and happens frequently in training. There were two venting holes in the top of the airplane, and there was a fierce battle with the fire. She did not see the use of high reach extendable turrets in an elevated position.

She assumed the lieutenant position with Rescue 33 because Lt. Monteverdi was in charge of fire operations. He instructed Firefighter Grindstaff to reposition Rescue 33 to the aft of the airplane for easier access. She disconnected the handline, left it in position, repositioned to the rear of the airplane and established a new line that was taken to 4L. Lt. Emmons led a large line to the back of the airplane in case reentry was needed. She reestablished contact with Lt. Monteverdi. He was having trouble reaching the incident commander Captain Anthony Robinson (Rescue 65). He asked her to help, and she attempted to use her radio. She asked a third firefighter if he could reach Capt. Robinson and he said no as well.

Triage was a long way off - she believed it was on taxiway F. She did not go to the triage area but she made one trip to the passenger collection area. Mutual aid companies began arriving from the city and she recognized people she knew. She did not recall seeing any ambulances or medic units but they may have been there and she did not see them. When asked if she had any recommendations based on this experience she offered that she was lucky she was able to ascend the 2L chute due to its slight angle. She would recommend something to assist firefighters in accessing the airplane. She also stated that communication from the pilots was poor. Better communication would have really helped. In a previous incident she responded to the pilot was last off the airplane and clearly communicated information to the firefighters about smoke in the cabin (e.g. location, color, etc.).

She had received ARFF training in Colorado and had recurrent training in April.

Interview: Mr. John Yee, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 10 July 2013, 1323-1358
Location: Fire Station 3, San Francisco International Airport
Representative: Dale Carnes, Assistant Deputy Chief, San Francisco Fire Department (Airport Division)
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA), Kathryn Reneau (FAA)

Firefighter Yee had 25 years of service with the SFFD, the last 16 at SFO. Firefighter Yee was at Fire Station 2 when he heard the Alert 3, "plane crash on 28L." He geared up and got in Rescue 9 as the driver. Rescue 9 was an Oshkosh 4500 gallon vehicle with 500 gallon foam capacity. He left Fire Station 2 and made a left down taxiway C. He saw a column of black smoke as soon as he left the station. Rescue 88 reached the scene first and parked at the 11-12 o'clock position and began applying foam to the fuselage and engine and appeared to be knocking the fire down.

He arrived second and saw that the slide/rafts were deployed on the left side. He shot foam on top of the fuselage aiming it just aft of the cockpit. He was trying to protect the passengers as they evacuated. He was using the bumper nozzle. He made the decision to reposition around the left side of the airplane and took the 5 o'clock position. He applied foam to the fuselage to keep it cool. He did not recall seeing anyone coming out of the rear of the airplane. When he repositioned to the aft of the airplane he saw a lot of people milling around and had to tell them to get out of the way by honking at them. He did not see anyone coming down slide/rafts, but he was paying attention to people on the ground so he did not run over anyone. He had a rider, Firefighter Saxton, who was a second pair of eyes and only left the vehicle when he was backing up and helped guide him.

He repositioned to the front of the right wing and he continued to dispense foam until given notification by Lt. Monteverdi via radio that the airplane was fully evacuated. He recalled that door 3R was open, but he did not see any other door open on the right side of the airplane. He pierced the fuselage two times - once over the cockpit and once over the wing. He had no problems piercing the fuselage or dispensing the agent. He had previously practiced piercing with the HRET and Snozzle on the SFFD training device.

When he ran out of water he and Firefighter Saxton went to refill at Fire Station 2. He came back and repositioned at 9 o'clock by the 2L slide/raft. He positioned the boom with nozzle through the vent hole in the roof above 2L galley to dispense foam and water. He then lowered the boom and put it in through the 2L door. He turned on the FLIR camera so he could see in the cabin facing aft. He saw hot spots and hit them with water and foam, the hot spots were in the airplane right overwing area. He varied his agent application, using foam and water and fog and straight streams. He stayed in this position until he was advised to stop spraying.

When asked he stated that he did not observe anyone lying down and everyone moved out of the way when he told them to. He refilled just once and did not run out of foam. The plane vented

in one spot, but the hole subsequently got larger. He had no communication problems. When asked if he had any recommendations based on this experience he replied that he did not.

Interview: Ms. Sally Saxton, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 10 July 2013, 1430-1520
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Danny Gracia, San Francisco Firefighters Local 798
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA), Kathryn Reneau (FAA)

Firefighter Saxton had 21 years of service with the SFFD, the last 6 at SFO. She was in Fire Station 2 when she heard the Alert 3 for an airplane down. She ran to Rescue 9 and got her personal protective equipment on and started rolling. She served as the rider on Rescue 9. Rescue 88 was to the right, and they followed them out. As they crossed the runways 1R and 1L she saw black smoke.

When they arrived at the scene Rescue 88 went to the right and took the 1 o'clock position. Rescue 88 was knocking down a fire at the engine. People were evacuating and she was worried about hitting them with high pressure water. Rescue 88 had the fire knocked down and they thought they would be more effective at the rear of the airplane, so they repositioned. They went around the nose and down the left side of the airplane to the rear, assessing the situation. When they first came around the nose of the airplane she saw people on the slide/raft and also standing on the cart road taking pictures. Everyone she saw was ambulatory. It was "refreshing" to see people walking away from the airplane. She was very careful about looking for people, and did not see anything covered or anyone lying down. She further explained that a victim could have been nearby, but that she simply did not see one. She stated that a victim "wasn't in front of us, I know that."

When they got to the rear she got out and tried to clear a path through the debris. She got out of the vehicle because people were still evacuating from door 3R. There were no slide/rafts on the right side behind the wing. People were coming out of door 3R and slipping down, so she went to help them down and told them to get away from the airplane. There was a bunch of debris under the door. A young man stopped her and said "my mom and sister are inside." She went into the airplane through the big hole in the aft section of the airplane. There was a flight attendant attending to a woman about 5 or 6 feet inside - in the middle section, close to the back. There was a man and woman in front of them and the woman appeared to be drifting in and out of consciousness. The man was tending to her. The flight attendant did not want to leave, but she told her to get off of the airplane. She used her radio to call for help and requested a long board. At that time she had good visibility. She made a radio call "Rescue 9, two victims. Need long board." She was told "you're on control one, go to control two." The man remained with the woman and she saw movement out of the corner of her eye and went to help. She started moving things around and saw a leg under light panels and seats. She found a woman under the debris. A policeman appeared and helped lift up the seats so the woman could be pulled out. She grabbed the woman's legs, he got her shoulders and they pulled her out. They took her out to the paramedics who were right there. She went back in the airplane and the woman with the broken leg was gone, the other woman was unconscious. She was put on a long board. She

helped carry the woman almost to triage, then put her down and ran back to the airplane. She could not recall how she got back into the cabin, but she went back in to check for more people.

The seats in the aft cabin were all mangled. She looked for additional people but did not see anyone, so she walked forward. She saw an older man who was in really bad shape. He was bloody and gurgling. Lt. Monteverdi came up the aisle and said "we've got to get out." She told the passenger to "Get up! Walk!" and he got up and walked to door 4L and exited with her and Lt. Monteverdi each taking a shoulder. He did not look like he would be able to walk, but when she yelled at him he did. She could see the situation in the cabin was deteriorating, there was black smoke and visibility was getting bad.

She went to Rescue 9 parked at door 2R. There was foam and mud all over the area - she was waist deep in it. She came up from behind the rig and got into her seat inside the vehicle. Visibility from the rig was bad due to foam and smoke. They were looking for the best spot to insert the piercing tip. They pierced the airplane on its side, trying to get 6-inches above the window. They were getting a lot of black smoke and foam from the other rig and it was making it hard to see. They stayed in this location until they needed to refill, then they went to Fire Station 2.

When they came back, they went on the other side of the airplane for better access - near door 2L. When they were positioning they were told to be careful because of a deceased person. She believed the deceased person was by the cart road, near the 2L slide/raft. The body was covered with a blanket. Their tire scraped the slide/raft when they were positioning. They sprayed foam under the wing due to a fuel leak. At one point Chief Johnson opened their door and told them to stop because a rescue squad was going inside the airplane. She felt confident that everyone was off, unless there was a small person under the seats. She felt confident that no one was left on the airplane based upon her search and the fact that they did not see anyone on camera. The whole time they mostly used foam. The left wing was leaking fuel, so they put a layer of foam on the ground. They stayed in that location for a while and then repositioned.

When asked if she had any recommendations based on this experience she stated that everything happened very quickly. She felt having 3 people on the rig would have been better than 2. She did not recall any communication problems, but the language barrier with the passengers was an issue.

Interview: Mr. David Monteverdi, Lieutenant, San Francisco Fire Department
(Airport Division)
Date/Time: 09 July 2013, 1533-1630
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Danny Gracia, San Francisco Firefighters Local 798
Present: Courtney Liedler (NTSB), Randy Moseng (FAA)

Lt Monteverdi had 23 years of service with the SFFD, the last 10 years at SFO. He had just taken a call in Terminal 1 near Gate 22. He was on his way to the tarmac via the jetway stairs when he heard "Alert 3, plane crash" on his handheld radio. He and Firefighter Kirk came down the stairs already in their turnout gear. He got into Engine 33, a structural fire truck. Firefighter Grindstaff was the driver and Firefighter Kirk was also assigned to Engine 33. They drove across runways 1L and 1R and around the terminal "arm." Lt. Monteverdi saw the airplane and a large black plume of smoke. Rescue 88 was first vehicle on scene and Rescue 9 arrived behind Rescue 88. After crossing taxiway M and over the runways the vehicle made a right onto taxiway F. He called Fire Control and advised what he saw at the scene. He instructed Firefighter Grindstaff to park on taxiway F near the taxiway L intersection. When he got to the site he set up incident command. Within minutes Captain Anthony Robinson arrived and took over command of the site. At that point Lt. Monteverdi became in charge of fire operations and dealt with fire extinguishing and passenger safety.

He assisted evacuating passengers in the field area with Firefighters Kirk and Grindstaff. When they arrived, all of the passengers he could see were ambulatory – a few passengers were standing near taxiway F. He proceeded to the airplane and saw passengers coming out door 2L. He did not recall seeing anyone lying on the ground, but he did say he believed there was a person under a blanket when he arrived on scene. The person on the ground under the blanket was forward of the wing area near the slide/rafts, outboard of the missing engine on the left side. He stated that it was possible that medic units 91 and 93 may have covered the passenger.

Lt. Monteverdi watched other firefighting vehicles to make sure agent was being applied. Rescue 88 was on the right side of the airplane applying agent on the fire in the number 2 engine and the ground. The fire was knocked down quickly. There was fuel from the left wing pouring out near the fuselage. He instructed foam to be put on the wing and a foam blanket on the ground. A few passengers were still coming out of the slide/rafts. Lt. Monteverdi saw an elderly man on the ground and decided to go into the airplane. He had the Engine 33 back up closer to the left wing and had a line extended. Firefighter Kirk went up the slide/raft at 2L. He and Lt. Emmons followed inside the airplane after Firefighter Kirk. Lt. Monteverdi was at the 2L door feeding the handline into the airplane for Firefighters Kirk and Emmons. He saw flames to the right toward the top of the fuselage. Lt. Monteverdi went toward the cockpit searching for passengers. No one was found in the forward section of the airplane. He went toward the aft and met up with Firefighters Emmons and Kirk and they all went toward the rear of the airplane. Visibility in the cabin was good and most of the seats in the forward areas were upright and intact.

Four passengers were found still on board and needed assistance to evacuate. Lt. Monteverdi called for backboards. He saw black smoke coming toward them in the aft of the airplane. As

the last man was extricated from the airplane the smoke became worse. The last man was evacuated over the seats and exited from door 4L. He was the last passenger off the airplane and Lt. Monteverdi was certain all other passengers were off. There was no need to change his SCBA bottles while in the airplane. He was not on air the entire time and took his mask off as he moved to the rear.

It was now an exterior fire and ARFF deployed water until the fire was extinguished. Exterior extinguishing was occurring on both sides of the airplane. Lt. Monteverdi got word of 50+ passengers who were unaccounted for. He stopped foam application on the exterior and firefighters went back into the airplane to look for additional passengers. He went into the airplane again and found no additional passengers; he exited again through the tail. He then remained outside the airplane until the fire was extinguished. He saw three passengers closer to the water and escorted them to the triage site south of the airplane near taxiway F.

Lt. Monteverdi directed ARFF trucks where to position. The active fire was forward of the wings, on top of the fuselage. The fire seemed to be in the bulkhead and top of the fuselage. The fire continued to flare up until it vented on the roof. The Snozzle on Rescue 10 successfully pierced aft of door 2L. It appeared the piercing tip broke as it was removed. The Snozzle was generally more effective in directing the stream than the turret and was used in over roof burn through situations. There were two Snozzle devices, one on Rescue 9 and one on Rescue 10. There was no on-scene resupply, all resupplies happened at a hydrant at Fire Station 2. He left the scene between 1830 and 1900.

Lt Monteverdi was in structural firefighting gear. He stated that ARFF vehicles were staffed with two people per vehicle, one driver and one rider (firefighter). Two ambulances, 2 medic units (Rescue 91 and 93), 2 engines, 1 truck, and 4 ARFF vehicles were based at the airport and responded to the accident site. Fire has its own dedicated frequency. When asked if he had any recommendations based on this experience Lt. Monteverdi had no comments or concerns related to safety. He felt the response went well.

Interview: Ms. Michelle Grindstaff, Firefighter, San Francisco Fire Department
(Airport Division)
Date/Time: 14 July 2013, 1035-1139
Location: Fire Station 3, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB, Terry Smerdel (SFFD)

Firefighter Grindstaff had 19 years of service with the San Francisco Fire Department, the last 14 years at SFO. She stated that Engine 33 was at Terminal 1 near Gate 22 at another call. They had just cleared and she was waiting for Lieutenant Monteverdi and Firefighter Kirk to come out. She was listening to ground frequency and heard "clear all traffic." A moment later she heard fire dispatch issue an Alert 3 for an airplane accident around the 28 runways. She donned her turnout gear and, when Lt. Monteverdi and Firefighter Kirk returned to the truck, they responded to the airplane crash. She said they crossed runway 1L and 1R on taxiway M. She turned left on taxiway L to taxiway F and then turned right, just passing taxiway P. While en route she saw heavy black smoke.

She parked on the far left of taxiway F, near the grass. Upon arrival she saw passengers evacuating the airplane. The passengers stopped at two locations: by taxiway F and N; and in the grassy area near the rear of the airplane. She saw the 1L and 2L slide/rafts deployed. Most people were coming off the 2L slide/raft. She saw no one coming out of the back of the airplane.

An officer told her to stay off of taxiway F and help passengers to move away. She got out of her truck and told passengers milling around in the field to come toward her. She went to Rescue 93 to get a megaphone but she did not get to use it. She saw a firefighter from Rescue 91 and handed the megaphone to them instead. (Rescue 91 was parked next to Rescue 93.) After about a minute Lt. Monteverdi told her to pull Engine 33 closer to the airplane so they could put a line inside. She moved Engine 33 across the dirt and parked parallel to the plane on the left side just past the 1L slide/raft. While repositioning she saw a person laying there so she ensured that she avoided what looked like a small woman curled up (with her knees bent) on the ground. By their position she thought the person was dead and reminded herself to take care because there might be other deceased victims lying around the airplane. Rescue 88 was at the 1 o'clock position and there was heavy black smoke coming from the roof and out of both doors. More smoke was coming out of door 1L than 2L.

She said she pulled the 150 ready line from the rear right side of Engine 33. She saw one person deplane down the slide/raft and thought he was the last person off the airplane. Fuel was coming out from under the left wing. She dragged the 150 ready line over to the slide/raft at door 2L. Lt. Emmons and Firefighter Kirk grabbed the nozzle and went up the slide/raft at 2L. Lt. Monteverdi entered ahead of them. She got a signal from Firefighter Kirk to charge the line from Firefighter Kirk at the doorway and she charged the line.

There was still one male crew member at the top of the slide/raft, she yelled to him to come down and he did. She heard on the radio from someone asking for backboards at the rear of the airplane. She took a backboard from Engine 33 and threw it up to door 2L and left it there. She did not know there was access to aft of the airplane. Lt. Monteverdi came out of door 2L and

said he needed a line at the back of the airplane. She disconnected the line that she had deployed and left it. Firefighter Tauber took Engine 33 to the back of the airplane (about 50 feet behind it) and commenced with pump operations. She grabbed the backboard and walked aft. She was no longer involved with Engine 33.

Rescue 10 was at the 9:30 or 10 o'clock position. They were spraying foam and water under the wing close to the fuselage where the fuel was pouring out. She told Rescue 10 to hold off spraying so she could make sure that the fuel on the ground was getting covered with foam. Then she went to the back of the airplane. She grabbed a backboard and walked into the back of the airplane and gave it to a firefighter. They were tending to passengers that were lying on the ground. She saw firefighters, airport operations personnel, and SFPD near the back of the airplane. She believed that all of the firefighters were out of the airplane at that time. She saw Lt. Monteverdi, Firefighter Kirk, and Lt. Emmons and they looked tired. The fire was getting worse and the roof had vented, the ARFF trucks were putting water on the airplane. She went to Rescue 93 and brought out a case of water for the firefighters.

She heard that the ARFF trucks were going back to refill with water. She asked Lt. Emmons if she should go to Fire Station 2 to get Rescue 37, the relief vehicle. Lt. Emmons said yes so she told Lt. Monteverdi she was going to get Rescue 37. She walked to taxiway F and took Rescue 91. Rescue 91's driver was doing triage at that time and she drove down taxiway F and crossed runways 1L and 1R and then crossed taxiway E to Fire Station 2. All of the doors at the station were open and there were no trucks inside. She turned around and went back to the site. On the way back she called Lt. Monteverdi to ask about getting another relief piece from Fire Station 3. She could not reach him and continued back to the site. That was the only time she tried to use her radio during the event. She parked Rescue 91 back where she got it. She saw Lt. Monteverdi carrying a woman to triage. He set her down and she walked the rest of the way.

She made sure firefighters were out of the way so they did not get injured by the turrets. She did safety duties and made sure Engine 33 had everything they needed. There was a charged 50 foot line out on the ground on the left, aft side of the airplane with one small 100 foot line off of it. They also used the 200 foot ready line off the engine and brought it in the back of door 4L.

The turrets were spraying water and she was standing aft of the wing of the airplane on the right side. Lt. Monteverdi asked if firefighters were inside. She told him she saw firefighters inside the 1R door. Lt. Monteverdi said to stop all ARFF operations because firefighters were inside. He did this over his radio. It was not too long before they resumed firefighting operation again - less than 1 minute. She did not enter the airplane until the fire was out when she went into door 4L with others to get the hose line out. She was near door 3L where Firefighter Kirk handed her the hose line. Engine 33 was one of the last trucks to leave the scene.

When asked if she had any recommendations based on this experience she offered that they wasted 1 or 2 minutes by not driving right up to the airplane and that she felt they were out there by themselves for a while. She would have liked to see more people to help move passengers away from the airplane. She believed the airport firefighters did a good job but that the mass casualty unit did not show up on scene with all the medical equipment.

Interview: Mr. Michael Kirk, Firefighter/Paramedic, San Francisco Fire Department (Airport Division)
Date/Time: 09 July 2013, 1639-1824
Location: Fire Station 3, San Francisco International Airport
Representative: Dale Carnes, Assistant Deputy Chief, San Francisco Fire Department (Airport Division)
Present: Courtney Liedler (NTSB), Randy Moseng (FAA)

Firefighter Kirk had 11 years of service with the SFFD, the last 3½ at SFO. About 1115, Lt. Monteverdi, Firefighter Grindstaff and he were investigating an odor in Terminal 1. He and Lt. Monteverdi had just cleared the call and were making their way back outside. As he approached Engine 33 he noticed the Firefighter Grindstaff putting on her gear. She looked at him and said "plane crash, plane crash." He donned his gear and got into Engine 33. They drove to the site, crossing over runway 1L and 1R via taxiway M. When they asked for clearance to cross, air traffic control announced the "airport is yours." When he saw the Asiana airplane smoke was billowing from the front of it. They approached the scene and stopped Engine 33 on taxiway F.

Police Officers Cunningham and Derrick Lee were at the base of slide/rafts assisting passengers with an airfield safety officer when he arrived. Five flight attendants were still at the doors and at least two flight attendants were inside. Firefighter Kirk was wearing structural turnout gear. Lt. Monteverdi told Firefighter Kirk to assist the passengers away from the area. He and Firefighter Grindstaff corralled the passengers milling around in the grassy area on the left side of the airplane. All of the passengers in the grassy area were ambulatory. He saw a large amount of debris but no victims. Passengers were collecting to the left and right of him on their own. Within 4-5 seconds, Firefighter Kirk approached the 2L slide/raft at a 45-degree angle. Once he got to the slide/raft he saw passengers evacuating from doors 1L and 2L. He assisted the passengers off the slide/raft and toward taxiway F. He directed passengers who could walk to his right and directed them away from the airplane. If a passenger got to the ground at the bottom of the slide/raft and was unable to walk, Firefighter Kirk carried the passenger to an area approximately 20 yards away where they would be out of danger. He was unsure how many non-ambulatory passengers he helped. There was a police officer standing near the path that stood with the passengers he brought to the area. There were a lot of young people crying.

Engine 33 repositioned to a location near the 1L slide/raft. People were yelling "people trapped" and were asking for help. They were asking for a knife for a trapped passenger. He felt he needed a handline to safely enter. Lt. Emmons (Rescue 88) was standing next to the 2L slide/raft and he asked if he could go in and she advised it was unsafe without a handline. There was a "waterfall" of fuel coming from the leading edge of the left wing. It was forming a large puddle under the wing. He looked inside the 2L door and saw flames inside the cabin near the 2R door, from the right side of the door upward and overhead. Firefighter Kirk saw an airfield safety officer in the doorway yelling for help with a trapped person. He asked Lt. Emmons again to enter the airplane and she gave permission with the use of a handline. The hose was extended and he took the nozzle to the 2L slide/raft. He grabbed the hose and made his way up the 2L slide/raft on his knees. Lt. Monteverdi went up the slide/raft ahead of him. There were still flight attendants in the door with passengers. They were assisting passengers onto the slide/raft. He

told the flight attendants to evacuate down the slide/raft, only a couple more passengers exited at that time.

Visibility to the cockpit was clear and he could see the cockpit door was open. Firefighter Kirk called back for the handline to be charged prior to proceeding. Lt. Monteverdi was on his left conducting a search of the forward area. Visibility was hazy but he could see the forward cabin was intact. He made sure the forward cabin was clear. He was looking for passengers and saw only Lt Monteverdi. He made a right-hand turn near the galley and proceeded aft down the aisle past the 3L doorway. He saw fire on the right side of the airplane spreading upward toward the overhead bins. He sprayed water to knock down the fire which was about 10 feet in front of him. He said visibility within the cabin got better as he went further aft. He stated that he limited the use of water from the hand-line so that its use would not hinder the search efforts.

He saw an Asian male passenger sitting in a seat and looked back at Lt. Emmons who remained with a charged handline behind him. He did not want the fire following them without assistance. He looked back for the possibility of help with the (heavy) man sitting in the seat. His head was facing aft and Firefighter Kirk wanted help with his legs. Visibility was worsening inside the cabin. The passenger was at the bulkhead with overhead debris coming across his chest at a 45-degree angle. The victim was leaned back in the seat with the debris over him. Firefighter Kirk struggled to remove the debris and finally broke it off and threw it aside. The Asian male was approximately 250 pounds and he asked him if he could walk. The man was conscious and moaning but not moving. Firefighter Kirk picked him up out of the seat and attempted to get him to walk off the airplane. The man collapsed, unable to walk. Firefighter Kirk pulled the man down the left aisle toward the rear of the airplane. The aisle was cluttered and difficult to traverse. An Asiana flight attendant was trying to help another stuck passenger. He put the man down in the aisle and saw two additional passengers in the very rear of the airplane. One of the passengers was located on the far left side of cabin. She was pinned in her seat, and he described the passenger as looking like a “pretzel.” He saw another passenger gently crying who was in the aft middle section, in a seat tipped back. She had a broken leg. He asked Firefighter Phillips to assist him however Firefighter Phillips left the area without assisting. Firefighter Kirk asked for a backboard but could not wait; he needed to get the passenger off. He told Firefighter Atwater (Rescue 56) that he needed assistance and she came forward to assist him. Firefighter Kirk radioed that there were four victims needing assistance.

He navigated the larger man over the aft seats and out of the airplane. He looked left and right as he exited looking to ensure there were no other passengers remaining in the cabin. He asked the victims if they spoke English and had no response. He completed basic trauma triage on them, looking for open bone fractures or chest wounds. Police officers were outside the airplane when he exited the rear door. One victim with a broken leg was still stuck in the seat. Firefighter Atwater reentered and attempted to free the passenger. He and Lt. Monteverdi assisted in evacuating the passenger. The passenger was brought out of the tail and Kirk completed basic trauma triage on her.

Thick black smoke was coming out of the airplane tail and Firefighter Kirk felt that he could not reenter the interior of the airplane. He saw Officer Cunningham emerging out of the smoke from the 4L door. He was asked if all passengers were gone. Cunningham said “yes.” Firefighter

Kirk was confident that all passengers were off the airplane. He radioed for help with the multiple patients that they had removed from rear of the plane. He was concerned with the passengers' safety due to fuel leaks and fire so he worked to move the passengers 40 or so yards away. He took the victims toward taxiway F on the baggage cart path. He was also concerned with where Lt. Emmons was as he did not see her come out of the airplane. He had seen her in the airplane earlier. The three patients on the ground were with Officer Valenzuela. He took off his breathing apparatus and someone came with a backboard. The larger male passenger was placed on the backboard and he was taken to the casualty area. Lt. Emmons and Lt. Monteverdi were with him at that time. When he made his way back to the area to search for additional patients, other medics and more firefighters were there. He walked down the concrete path away from the airplane and he saw an Asiana flight attendant who was tagged yellow. She needed a backboard and Kirk told her that help was on the way. He went back to Rescue 33 to get water and to see if Lt. Monteverdi needed additional help. He was too fatigued to continue toward the 28 runway ends to search for victims. At that point he believed the event went from a rescue to a fire response. He said that the on-scene incident commander for this accident was Chief Siragusa.

When asked if he had any recommendations based on this experience he said that it was very overwhelming even though there were only four passengers to be rescued. He believed they were lucky. He felt staffing was the biggest hindrance. He stated that communications were difficult. He radioed for assistance with victims several times but never received a response. Once mutual aid responded to the site communications completely stopped. Mutual aid was provided radios at staging but they may not be savvy in their use on the airport. He tried communicating with SFPD but could not get anyone. He felt the police communications plan is ineffective due to new re-banding that just took place. There were passengers reported in the water and Kirk inquired about them but received no response. He would also like to see that other people besides ARFF drivers have the ability to use the vehicles. He said that he would have liked to have been able to get into a vehicle to respond to the scene. He had applied to be a relief driver and had been declined, but given no reason. There are extra vehicles sitting in the fire stations. He stated that he had been through the 40 hour initial training, annual recertification training, and the department training curriculum.

Interview: Ms. Michelle McCoy, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 14 July 2013, 0930-1020
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Danny Gracia, San Francisco Firefighters Local 798
Present: Pete Wentz (NTSB), Randy Moseng (FAA)

Firefighter McCoy had 20 years of firefighting experience, the last 5 years at SFO airport. She was inside Fire Station 3 and standing next to Rescue 11 (an Oshkosh Striker 4500) when she heard the Alert 3 over the speakers. She was joined by Firefighter Hudson who had to retrieve his turnout gear from Rescue 93, which he was driving earlier. McCoy put on her turnout gear and proceeded to drive out of Fire Station 3 on taxiway M. She received clearance from the tower to cross runways 1L/1R and turned left on taxiway L toward 28L. Arriving on the left side of the airplane, she observed the slide/rafts deployed and people coming down them. She observed many passengers on the left side of the airplane and recalled thinking that the evacuation looked successful.

Firefighter McCoy positioned Rescue 11 on the right side of the airplane so she would not hamper the evacuation efforts. She positioned Rescue 11 on runway 28L at the 3 o'clock in front of the wing. The smoke was grey at that time with small flames. She noticed that door 1R was open. She sprayed foam on the wing, engine and fuselage of the airplane. Foam was coming down the length of the airplane from Rescue 88 that was positioned at the nose of the airplane. Firefighter Hudson let her know passengers at 3R were getting hit by foam so she radioed Rescue 88 and asked them to hold off until the passengers moved away from the airplane. Firefighter McCoy recalled that the color of the smoke had changed to white at this point and she had requested to refill Rescue 11 as it had depleted all its water. She drove to Fire Station 2 and refilled Rescue 11.

When Rescue 11 returned she positioned it at the 11 o'clock position on the nose of the airplane. She stated that a firefighter from Battalion 9 was on the ground and Engine 15 (a city mutual aid vehicle) was working alongside her on the forward left side of the airplane. She was foaming the forward fuselage where the airplane roof had vented with her roof turret. She recalled a radio transmission that the cabin was clear and to pierce the fuselage. After another vehicle finished piercing, the Battalion 9 firefighter kept opening her door requesting water and foam, but she followed an order received via radio from Lt. Monteverdi to stop. Rescue 10 requested her position because they had a high-reach extendable turret (HRET) and Snuzzle so she had Firefighter Natalie Hernandez from Engine 15 help her back out. Rescue 11 was again out of water so she proceeded to Fire Station 2 to refill.

While at Fire Station 2 she picked up Firefighter Rob Laeace, who was off duty but responded to the station. Upon returning to the accident site she heard her name on the radio to be relieved. Lt. Monteverdi radioed her to report to the marine boat house with Firefighter Matt Wayne to search the water at the end of runway 28L. She left Rescue 11 with Firefighter Laeace and got a ride from an airport safety officer to the boat house. She donned her wetsuit and loaded all the extra life vests she could find in the boat house. Firefighters McCoy and Wayne (along with 4 firefighters from Engine 39) took Rescue 55 (a 48 foot Moose boat) out to the end of runway

28L. Rescue 55 was equipped with a fire hose, life vests and a first aid kit. They maneuvered slowly around the waters off the end of 28L and found nothing but small pieces of insulation. McCoy stated there were other agency boats in the water but she could not remember which agency they represented. After about one hour in the water they returned to the boat house, and she changed back into her turnout gear and an airport safety officer gave her a ride back to the accident site. She took back operations of Rescue 11 until released by Fire Control around 2000. When further asked if she had any safety recommendations based on this experience Firefighter McCoy stated that there were conflicting commands and was unsure who was in charge of operations on the airport - the city commander or the airport commander.

Interview: Mr. James Hudson, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 12 July 2013, 1155-1245
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Shon Buford, San Francisco Firefighters Local 798
Present: Pete Wentz (NTSB), Randy Moseng (FAA)

Firefighter Hudson had 20 years of firefighting experience, the last 8 years at SFO airport. He was inside Fire Station 3 when the alert came in as an Alert 3 for an airplane crash at 28L. He retrieved his turnout gear and went to Rescue 11 in his position as a rider. Rescue 11 left Fire Station 3 and rounded the threshold on runway 1L/1R and continued on taxiway L to the accident site. He noticed smoke coming from the airplane as Rescue 11 approached the scene. He noticed passengers around the left side of the airplane and that the airplane's fuselage was lying on the dirt. His driver, Firefighter McCoy and he discussed positioning Rescue 11 on the right side of the airplane away from the evacuation and closer to the smoke. They positioned Rescue 11 on the 28L runway at the 3 o'clock position in front of the wing. There was grey smoke and flames near the airplane engine so they used the bumper turret to apply water and foam. They saw passengers coming from the 3R door area and noticed water and foam from Rescue 88 hitting them. Rescue 88 was positioned at the nose of the airplane. Rescue 11 radioed Rescue 88 to stop the spraying water and foam down the top of the airplane until passengers got out of the way.

Firefighter Hudson later heard a radio call announcing all the passengers had gotten out of the airplane. He got out of Rescue 11 and helped Firefighters Lee and Plunkett (who came from the right side of the airplane) with a ground ladder. They placed the ladder at the 1R door and Rescue 56 supplied a handline. Firefighters Lee and Plunkett went up the ladder and started spraying in the 1R doorway. Firefighters Hudson and Martin noticed heavy smoke and fire moving forward in the airplane so they told Lee and Plunkett to back out of the airplane. The ladder remained at the 1R doorway and Firefighter Hudson and one other firefighter (unknown) made their way up into the cabin. Firefighter Hudson used a handline to spray hot spots in the airplane and he noticed Firefighter Phillips across the airplane before leaving the 1R area.

Firefighter Hudson joined Rescue 93 and was asked by Firefighter Rick Wendland to help with passengers at triage. Rescue Captain Tony Malloy instructed them to go the terminal and assist passengers at Gate 100. One elevator at the terminal was out of service so they organized a single line of passengers. They then sent as many up the single operational elevator as the elevator could hold. A paramedic team and mutual aid were assessing passengers and setting them up for transportation. Ambulances were being backed in to the receiving area and loaded with yellow and red tag passengers. A passenger name list was being developed with what hospital they were being taken to. When asked if he had any recommendations based on this experience he stated that he believed everything went well.

Interview: Mr. Jimmy Yee, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 12 July 2013, 1042-1122
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Shon Buford, San Francisco Firefighters Local 798
Present: Pete Wentz (NTSB), Randy Moseng (FAA)

Firefighter Yee had been a firefighter for 19 years in the SFFD and he had been assigned to SFO for 10 years. On the day of the accident he was assigned as driver of Rescue 10. Rescue 10 was an Oshkosh Striker 4500 Aircraft Rescue Firefighting vehicle, also known at SFO as a “big rig.” He said that the vehicle had a capacity of 4500 gallons of water for foam and had a “Hydrochem nozzle.” It also had a high-reach extendible turret (HRET). Rescue 10 had Halitron agent available through a hand-line and the vehicle has dry chemical agent on-board.

Firefighter Yee heard the alert call while in Fire Station 1. He proceeded to his vehicle and headed to the accident site. Firefighter Roger Phillips was the rider in the truck. Firefighter Yee asked for permission to cross runways 1L and 1R from the control tower and was cleared by the tower. He was told by the tower that the airfield was closed. When he arrived on scene he noted that other ARFF vehicles had already arrived and he saw passengers outside the airplane. Because of that fact he elected to take the 10 o’clock position on the left side of the airplane. He said he made his selection of initial attack position based on his personal assessment and not as a result of command direction. He saw fuel venting and leaking from the airplane’s wing. He applied agent (foam and water) to the fuel leak area and to the fuselage of the aircraft. He stated that he thought about the possibility of a “three dimensional” fire and considered that he might need to use dry chemical, but he did not dispense dry chemical agent.

After arrival Firefighter Phillips exited the vehicle for a period to assist other firefighters in entering the aircraft. During his time at the 10 o’clock position he noted firefighters leading a hand-line inside the aircraft through the 2L door. He remained in position waiting to pierce the aircraft while he continued to apply foam as needed to the area on the left wing that was venting fuel. He stated that he observed heavy smoke and some ‘bubbling’ of the top of the fuselage caused by heat.

Firefighter Yee received a call from Lt. Monteverdi instructing him that everyone was out of the aircraft and that he should move forward to pierce the airplane skin. Firefighter Yee moved Rescue 10 forward while extending the boom. He pierced the airplane aft and above the 2L door. Firefighter Phillips continued to operate the bumper turret dispensing agent while Firefighter Yee maneuvered the vehicle and HRET to pierce the fuselage. He said he pierced high on the fuselage and that the entry went well and was easy. He believed that during removal of the piercing tip the angle of the tip changed which he believed caused the tip to break and separate. He did not remember how much agent was dispensed using the penetrating nozzle.

When asked, he stated that he had completed the full training program qualifying him as a ‘big rig’ driver, which included operation of the HRET and penetrating nozzle (Snozzle). Firefighter Yee felt he had sufficient training on the use of the HRET. He said that he often uses the

Penetration Airplane Skin Trainer (PAST), and the fuselage of an available training airplane, to conduct practice Snuzzle penetration. He stated that he had practiced using the PAST device within the past few shifts.

A short time later Firefighter Yee noted that he was low on water and he departed the scene for water resupply, traveling with Firefighter Phillips to Fire Station 2. Rescue 10 was resupplied with water and they returned to scene, positioning the vehicle at the 2 o'clock position. There were fire vehicles on both sides of his position and heavy black smoke coming from the airplane. He dispensed agent using the bumper turret, attempting to dispense agent into the top of the airplane that had vented. He felt that his efforts were successful in knocking down the fire. Firefighter Yee received a call to reposition his vehicle to the 11 o'clock position to foam the left side of the airplane. After repositioning the vehicle, Firefighter Yee received instructions from Lieutenant Brown (Rescue 56) to dispense agent into the top of the airplane. Firefighter Yee stated that Firefighter Phillips used the bumper turret while he operated the high reach extendible turret to dispense agent into the airplane vent at the top of the airplane. He believed that he had approximately half of his water capacity remaining. He did not remember seeing any passengers in the vicinity of the airplane at that time. Firefighter Yee stated that he emptied all of the water from Rescue 10 and returned to Fire Station 2 with Firefighter Phillips for resupply.

Upon his return Lt. Brown guided them into position at the 11 o'clock position. He remained there dispensing agent as necessary (including dispensing agent with the HRET into the airplane vent holes) until he received the command to stop suppression and standby. He knew he was low on foam but could not remember how much foam was remaining when he received the call to standby.

He reported that his last live fire drill training was conducted in Denver in April 2013. When asked if he had any recommendations based on this experience he offered that more water resupply capabilities should be made available to ARFF vehicles during full scale disaster events and that he would like to see increased use of dry chemical for training, because it was not used very often.

Interview: Mr. Roger Phillips, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 12 July 2013, 1155-1311
Location: Fire Station 3, San Francisco International Airport
Representative: Dale Carnes, Assistant Deputy Chief, San Francisco Fire Department (Airport Division)
Present: Courtney Liedler (NTSB), Emily Gibson (NTSB), Terry Smerdel (SFFD)

Firefighter Phillips had 12 years of service with the SFFD, the last 4 at SFO. He was assigned to Rescue 10 on the day of the accident. He responded to the Alert 3 just after coming back from shopping for Fire Station 3. The announcement came over the intercom and said there was an airplane crash with multiple tones. The only rig at Fire Station 1 was Rescue 10. All of the rigs were at a drill at near Fire Station 2. The driver was Firefighter Jimmy Yee. They drove down taxiway A to J and crossed runways 1L and 1R to get to the crash site. Two slide/rafts were deployed as he approached runway 28L. He stated they were the “second rig in” and initially took the 7 o’clock position. As they were maneuvering into the 7 o’clock position, Rescue 9 drove inside of them so they maneuvered around to the 11 o’clock position. Passengers were still evacuating the aircraft via the slide/rafts and there were several flight attendants on the ground in the area. Two flight attendants were at the 1L and 2L doors. One male passenger in a white t-shirt with blood on it was holding his ribs at the top at the door. He looked like he was in pain and did not want to come down the slide. Firefighter Phillips noticed a lot of fuel coming out of the left wing. It was “gushing out.” He told his driver, Firefighter Yee, to maneuver inward to a better position to be able to blanket the fuel.

He exited the vehicle and guided Rescue 10 into position. Approximately 15 feet away he noticed a young female on the ground, in a fetal position. She looked to be dead “by appearance,” but he did not check her vitals. She had on blue jeans (that were torn at the ankle), no shoes (or none that he noticed), and there was dust all over her. He thought it was a mannequin because her face looked like wax. Her eyes were rolled back and her face “looked like a grimace.” She had on a brown shirt that looked like dust. The body looked like a CPR dummy they used for training. When he was moving his driver into position he saw Lt. Emmons to his left and told her about the body. She replied “yes, yes, okay, okay. We’ve gotta get a line inside.” He also notified his driver that there was a body on the ground.

He said a male flight attendant came over and told them people were trapped in the back. An airport operations employee was shouting they needed a knife. He went back to Rescue 10 and told his partner that he was going inside to help rescue so if anything was to happen they would know he was inside. He donned his SCBA and went the rear of the airplane. He did not believe that Rescue 10 had begun foaming the airplane yet. On the left side there was a torn open hole in the fuselage that was quite large but not big enough to enter. He asked Firefighter Atwater to get an ax and other tools. With the tools Atwater provided, he tried to break away some of the debris but had a difficult time. He continued around to the back of airplane to where the aft lavatories were supposed to have been and entered through a small opening. Inside the airplane on the right side, a lavatory was askew, the walls were pushed forward, overhead bins were down and the seats were “thrown around.” He believed there was a female passenger trapped in the rear most middle seats was wearing a white shirt and dark slacks. She was crying out and her

legs looked to be broken. He could not understand her but knew she was in a lot of pain. To his right was a man standing over another female passenger who may have had an oxygen mask on. They were approximately 2-3 rows ahead on the right side of the aircraft also in the middle seats. He stated heavy black smoke was coming down the fuselage at this time, hugging the top, and rolling through. He thought there was going to be a flashover. He saw Lt. Monteverdi and Lt. Emmons inside. There was also a police officer who had entered the airplane through the hole he did not think he could enter. The police officer was climbing over debris to another passenger. When he saw the smoke and thought there was going to be a flashover, he grabbed the woman in the white shirt under her arms and dragged her to get her out of there. Firefighter Kirk came over and helped. Firefighter Atwater was standing where he had entered near the torn-out bathroom area. She helped Firefighter Kirk take out the woman. He did not see them again after that.

People were shouting that they needed backboards. At this time the smoke was dropping and he thought the airplane was going to explode. He told other responders to forget the backboards, just drag them out. They were trying to get out these passengers on backboards through a hole in the airplane. He knew they could not get out that hole, so with his knife and tools, he attempted to make the bulkhead hole larger, but it did not work. He stated they were able to get the male and the female out another way and he exited through the rear of the airplane. Once the crew and the passengers were out, he went back to Rescue 10 (which was in the same position) and took off his SCBA. He got in the rig and helped his partner foam the airplane. The driver used the boom with foam and he used a turret. He did not believe that Rescue 10 used the piercing tip at this time.

The airplane had not vented when he emptied his first load of foam. When the tank was emptied they refilled and returned to the site at the 5 o'clock position. At that point the airplane was fully involved and he could see fire through the windows. The airplane still had not vented yet but the top of the fuselage was changing colors. They foamed and emptied the tank. The airplane was still burning when they went back to the station to refill for the second time. When they came back the fire had burned through and was still burning. He believed they returned to the 11 o'clock position. He could not see where the smoke was coming from. Someone was telling them where to apply the foam. At this time they pierced the plane and foamed again. The piercing tip broke. When the piercing tip was pulled out, it was hanging by the hose. He stated he saved a small amount of foam for protection. He was told to only use water at that point because the fire was dying out. There were hot spots, but not a roaring fire like before.

He stated there was a lot of chatter on the radio but there were no specific communications between rigs that were positioning around the airplane. He recalled hearing Rescue 88 arrive on scene, then nothing else. He also stated that communications went very well. He stated the second time he came back after refilling the victim near the left wing was covered. When asked for any recommendations he might have based on this experience he stated that he felt that things could not have gone better. He said that they were lucky that there was no wind and that the fuel was in the dirt and not on the tarmac.

Interview: Mr. Rick Wendland, Firefighter/Paramedic, San Francisco Fire Department (Airport Division)
Date/Time: 07 November 2013, 1208-1259
Location: Telephone Conference Call
Representative: Ms. Karen Kirby, San Francisco City Attorney's Office
Present: Jason Fedok (NTSB), Asst. Deputy Chief Dale Carnes (SFFD)

Firefighter Wendland had approximately 28 years of experience as a paramedic for the City of San Francisco, the last 3 years at SFO.¹ On the day of the accident he was assigned to Rescue 93, one of the two rescue vehicles (ambulances) operated by SFFD at the airport. The driver/EMT assigned to Rescue 93 (Firefighter Dan Tauber) was out food shopping for the Fire Station 3 at the time of the accident. Firefighter James Hudson (rider of Rescue 11) was covering for him as driver of Rescue 93 in the event any medical calls came in while he was out. When the Alert 3 (777 crashed on 28L) was announced at Fire Station 3, Rescue 11 driver Michelle McCoy wanted "a second set of eyes" with her, and Firefighter Hudson rode in that vehicle to the site. Firefighter Wendland followed them driving Rescue 93. The Alert 3 said that a 777 had crashed on runway 28L. He recalled that the ATC tower shut down the runways immediately and he was aware they were closed while he was driving to the site. There were no delays.

Rescue 91 arrived just in front of him and he parked behind it. The location on the pavement of taxiway F seemed far enough away for safety and provided a good surface to place pop-up tents, etc. It also almost exactly replicated the position where triage was set up on the airport's planning map and during the airport's disaster drills. The paramedic from Rescue 91 went immediately to the mobile command post while he stayed at the vehicles. He obtained a bullhorn and began directing a "wave of people" (he estimated 150-200 "walking wounded") toward him where he planned to begin triage. He became the lead triage officer and got out red, yellow, and green triage tags. He did that for approximately 15 minutes and knew mutual aid units would begin arriving shortly. He also walked into the grassy field closer to the airplane and triaged people in the grass who could not quite make it to triage. He recalled one woman with a broken ankle who he and another passenger helped carry to triage. He also assisted with several elderly people who had sat down in the grass. He explained that the purpose of triage was to try to help the most people as quickly as possible. It was not treatment, it was a categorization process.

Within the first 5 minutes of the event he attempted to radio Capt. Robinson to ensure that the airport's two emergency medical buses had been dispatched. He did not get a response so sent an EMT "runner" over to the command post to make the request in person. The buses arrived 2-3 minutes later and they began setting up treatment areas. The buses carry backboards, equipment, tarps, canopies, etc. When mutual aid arrived he directed them to passengers who could not make it to triage and they began to reassess the triaged patients, treating them, and preparing them for transport. He also asked them to set up a treatment area. He did not believe

¹ Chief Carnes explained that until about 12 years ago, paramedics were housed under the Department of Health, until they were merged into the fire department and cross-trained as firefighters. Firefighter Wendland spent approximately 15 years as a paramedic for the Dept. of Public Health before the merger.

any treatment was performed on patients at triage until mutual aid arrived. He thought that mutual aid arrived in a timely manner.

Firefighter Wendland recalled hearing requests for additional equipment from firefighters at the rear of the airplane. He informed Captain Robinson of the requests and Captain Robinson said he would look into what they needed and get it to them. When asked if requests for specific equipment could not be fulfilled because it was not on-scene he stated that, "I had plenty of equipment. I had all my equipment that was laid out in front of me... if they needed equipment, it had to go through the command post." Firefighter Wendland stated that he was on the same channel as the firefighters and could hear what they were saying but the medical group supervisor² was dealing with them. He added that "if it was requested through me for more equipment, I could have sent somebody over with equipment."

After the arrival of Paramedic Captain Tony Molloy, Firefighter Wendland took more of an administrative/coordination role, requesting and coordinating the arrival of different units as well as tasking arriving units. He later helped with re-triage and treatment of "walking wounded" passenger in the terminal until approximately 1730 or 1800. By that time all but about 10 passengers had been transported.

At no time during the event was he informed about victims on the runway or further back in the debris field toward the water. He believed that all of the ambulances stayed at the triage/treatment area and loaded patients there. He did not see any ambulances driving around the airplane. He stated that was a standard procedure. The goal was to get all of the patients into one area which made it easier to track patients and transport them out. He did not personally release ambulances from the airport. That was the role of the transport officer and the medical group supervisor. Ambulances were required to be escorted off the airport by airfield operations. He was not aware of any delays with ambulances leaving the airport. There were some delays with at least one fire vehicle leaving much later in the event - around 1700.

When asked about a reported event when an ambulance was allegedly delayed because the vehicle's driver could not be located Firefighter Wendland stated that there were private ambulances on scene and that he understood why a city firefighter would not want to drive it. He stated that he had probably been in hundreds of ambulances but would not feel comfortable getting into any particular ambulance and driving it with patients inside. He stated that the City of San Francisco had ambulances as well as South City Fire; however, the rest of San Mateo County was served by AMR under contract.

When asked about his annual training, Firefighter Wendland stated that he took monthly computer-based training on firefighting equipment and a medical module. There are also monthly Redcap (simulation scenario) drills that involve actual alerts and require vehicle responses to simulated scenarios.³ Upon arrival there is discussion about proper vehicle

² He stated that the medical group supervisor's primary role is to coordinate the entire medical portion of the incident at the command post. Initially the medical group supervisor was Meir Gordon, then Tony Molloy and Stuart Beach.

³ Chief Carnes clarified that three Redcap drills were done per month - usually on consecutive days in order to involve all of their staff. The drills were staggered so that they were done at different times of the day - including

placement and tactics. In some of the larger drills, they also set up equipment like the triage tents. He felt that he was well-prepared for the accident because of his training. He was surprised how applicable the drills were to the actual event and how similar their responses were. His biggest challenge was the communications. He had difficulty contacting the IC to report the number of passengers that had been triaged. He ended up going to the medical group channel to get a hold of someone. He was not surprised because he knew Capt. Robinson was busy. Communicating with AMR and the other agencies that arrived was very difficult. He spoke with Tony Molloy about this and he agreed that it would be nice if there was one perfect radio out there that they could talk to everyone with. There are three basic channels at the airport: the first is for regular dispatch incidents at the airport, the second is a tactical channel that the ARFF vehicles use to talk to the command post, and the third is the medical group channel where the medical group supervisor talked to triage.

the middle of the night. The drills were meant to evaluate response times, crossing runway procedures, basic communications, basic incident command, basic tactics and strategy, vehicle placement, etc. Redcaps have existed at the airport since he started there in 2008.

Interview: Mr. Jay Lee, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 14 July 2013, 0931-1024
Location: Fire Station 3, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB), Terry Smerdel (SFFD)

Firefighter Lee had 13 years of service with the SFFD, the last 3 years at SFO. He was on a call to investigate an odor at Gate 21 and Gate 23 in Terminal B. His partner, Firefighter Plunkett, saw the crash happen. They were driving Rescue 44 back to the fire station after the call and Firefighter Plunkett said to him “did you see that?” Firefighter Lee looked to his the left and saw a lot of smoke. He made a U-turn at gate C44. The radio in the truck was on but he did not hear anything. He saw Rescue 10 on taxiway F and followed it. They asked for permission to cross the runways and heard that all of the runways were closed.

He pulled up on taxiway F near N. There was a medical vehicle parked in front of him when he pulled up. Passengers were outside the airplane near taxiway N - between the airplane and taxiway F. Doors 1L and 2L were open and he saw the two slide/rafts deployed on the left side of the airplane in front of the left wing.

He and Firefighter Plunkett put on their SCBA and grabbed his medical equipment - which included an EMT bag, oxygen, and a defibrillator machine. He also grabbed his forcible entry tools which were an ax and a Chicago tool. They walked up to the airplane and heard a call for a ladder. They went back to the truck and repositioned closer to the airplane. They made a right on taxiway F then a right on taxiway N. They parked Rescue 44 at the 11 o’clock position of the airplane approximately 100 feet away. He then lifted the aerial ladder so he could take out the ground ladder. (The basket on the aerial ladder blocked the ability to pull the hand ladders out.) Firefighter Plunkett put the outriggers out and then they pulled out the 14 foot ladder and went around the airplane to look for the best location for laddering. When he walked around the tail (from the left to the right) he saw doors 3R and 1R open. He did not recall seeing any passengers at the time.

They laddered the right front side of the airplane at door 1R. He went to Rescue 56 which was at the 2 o’clock position and grabbed a handline. He turned the air for his SCBA and climbed up the ladder. Firefighter Plunkett stayed on the ladder and he entered. He saw a lot of black smoke at the door opening. He could still see the cabin but only first class. He had a difficult time getting inside the airplane because the slide/raft was deployed inside the plane. He had to step on the slide/raft to get in. He saw lots of smoke and flames in the cabin near the seats in first class. On the right and left sides of the plane he applied water with a hose line. At first the fire went down but it did not go out. He heard Firefighter Martin (driver of Rescue 56) say “get out, get out” as he told him he could see orange flames coming out the windows. He then stated that the vibrator on his SCBA went off indicating he was low of air. He further explained that the device was designed to make a buzzing sound on the face piece when the tank was low of air.

He exited the airplane out of 1R, regrouped, and changed his Scott bottle. He then put a Band-Aid on Firefighter Hudson’s hand. Firefighter Hudson asked to borrow his helmet because his

was missing. He did not give it to him. They disconnected the hoses from Engine 56 and repositioned Engine 56 to runway 28L because he thought the airplane was going to blow up. Engine 56 then went to refill the tank. At that time he saw a lot of black smoke. The fire trucks were extinguishing the fire on the airplane with foam from outside.

When Engine 56 returned from refill it parked at the 2 o'clock position. Firefighters were going back up the ladder at door 1R. There were at least 3 firefighters with a handline although he did not recall whether they were city or airport firefighters. He stood by Rescue 56 and saw firefighters come back out. By this time the fire had been extinguished.

He moved Rescue 44 to runway 28L and made a right turn from previous position to pick up the Scott bottles that were left on runway 28L. He then positioned Rescue 44 at the 2 o'clock position. He did not remember if the top of the airplane had burned through at that time. He walked around the back of the airplane to see if Rescue 33 needed assistance. They already had mutual aid helping them. Rescue 44 was still parked at the 11 o'clock position.

When asked if he had any recommendations based on this experience he offered that Firefighter Plunkett was called to another incident during this response. He felt that he should not have gone. He did not know what vehicle Firefighter Plunkett took or what type of incident it was. Firefighter Plunkett showed up again later. He also felt that additional personnel were needed and that the personnel that were recalled from off-duty status or mutual aid should have handled the call.

Interview: Mr. Todd Plunkett, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 12 July 2013, 1320-1415
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Shon Buford, San Francisco Firefighters Local 798
Present: Pete Wentz (NTSB), Randy Moseng (FAA)

Firefighter Plunkett had 26 years of firefighting experience, the last 3 years at SFO airport. He was assigned as a rider on Rescue 44 (an airport aerial ladder vehicle) along with Firefighter Jay Lee, who was the driver. They were responding to a call at Gate 23 in Terminal 1; however, it was cancelled before their arrival and they were dispatched to the accident. Firefighter Lee made a U-turn with Rescue 44 and Firefighter Plunkett saw the airplane still moving west on the left side of runway 28L. Firefighter Lee stopped Rescue 44 and they both got into their turnout gear. They then drove toward the airplane on taxiway A and turned right at taxiway E to meet up with Rescue 10. Rescue 10 had radioed for permission to cross runways 1L/1R and was waiting. They pulled up behind and waited as well, hoping they would be seen and allowed to cross with Rescue 10. As Rescue 10 crossed 1L/1R they were preparing to request permission as well but there was a radio announcement that all runways were closed and open to emergency traffic. Rescue 44 continued to the accident site and parked on taxiway F just into the grass at the airplane's 9 o'clock position.

Both Firefighters Plunkett and Lee got out of Rescue 44 and grabbed emergency medical equipment and forcible entry tools. As they were heading toward the left side of the airplane they were radioed by Lt. Emmons (Rescue 88 rider) and asked for a ground ladder. They dropped the equipment in the field and returned to Rescue 44 and repositioned it to the 11 o'clock position at the nose of the airplane. Firefighter Plunkett raised the aerial ladder high enough to retrieve the 14-foot ground ladder. He turned to the left side of the airplane looking for a door that was open. Both doors 1L and 2L had slide/rafts inflated so he and his partner Firefighter Lee proceeded towards the tail of the airplane. They continued looking for a spot to place the ladder but as they got near the tail, the fuselage was sitting on the ground. They went around the tail and headed toward the cockpit on the right side of the airplane. Firefighter Plunkett described the foam as waist deep on the right side of the airplane between doors 3R and 1R.

Firefighter Plunkett raised the ground ladder to the 1R doorway. Rescue 56 was positioned on the runway and Firefighter Martin had brought a handline to the 1R door area. Firefighter Lee took the nozzle up the ladder with Firefighter Plunkett hauling the line. Firefighter Lee fogged the entry area of door 1R with water and foam. They noticed the evacuation slide/raft was deployed inside the 1R doorway, but had been deflated. They continued to spray water and foam from the ladder and then climbed into the 1R doorway. Firefighter Martin (Rescue 56 driver) had noticed fire moving forward in the second cabin window and told Firefighters Lee and Plunkett to retreat from the airplane. They backed down the ladder and he heard his vibra-alert going off indicating his Scott air bottle was low. Lt. Monteverdi was in the 1R area and instructed Firefighter Plunkett to take Rescue 37 to the Coast Guard station to stand by for a hot refuel. Firefighter Plunkett requested a portable radio from Rescue 9 to be able to communicate with Coast Guard dispatch. Once Firefighter Plunkett arrived at the Coast Guard station he

learned they had cancelled the refuel and he returned to the accident site where he rejoined Firefighter Lee. He remained at the crash site until he was told to return to the station.

When asked if he had any recommendations based on this experience he offered that he was concerned that pulling him away from an airplane accident to refuel the Coast Guard helicopter maybe not have been the best way to handle resources.

Interview: Mr. David Brown, Lieutenant, San Francisco Fire Department (Airport Division)
Date/Time: 12 July 2013, 1350-1442
Location: Fire Station 3, San Francisco International Airport
Representative: Assistant Deputy Chief Dale Carnes, San Francisco Fire Department (Airport Division)
Present: Courtney Liedler (NTSB), Terry Smerdel (SFFD)

Lieutenant Brown had 16 years of service with the SFFD, the last 10 years at SFO. He stated he responded via Rescue 56 from Terminal 3 by gate 59. The call came in as an Alert 3 - airplane crash. He said he took a right turn at Terminal 2 and Gate 59 onto taxiway A heading east. While crossing taxiways A and B he saw smoke from the right side of the plane. He crossed runways 1L and 1R and told the driver (Firefighter Atwater) to go down taxiway F to loop around the tail of the airplane. Firefighter Atwater drove down the left side of the airplane to where the rear tail had broken off to the 5 o'clock position and they deployed a handheld line on the right side on the plane. The slide/rafts were deployed from doors 1L and 2L and all of the doors on the left side of the airplane were open. The passengers were evacuating and walking toward taxiway F and the water. He did not notice if triage was set up at that time. Doors 1R and 3R were open and doors 2R and 4R were closed. The front of the airplane looked pretty much intact compared to the back area.

He entered the airplane from 4L door where Firefighter Saxton was outside. Inside he observed movement under debris and saw two legs moving. He told Firefighter Atwater to assist the firefighters with the evacuation inside the airplane. He stated Firefighter Saxton and others lifted debris off the passenger to get the passenger out. They removed the passenger out of door 4L. Lt. Brown and Firefighter Saxton carried passengers toward taxiway F. They then handed the patient over to SFFD and mutual aid firefighters transported the patient. He reentered the airplane on the right side at the rear and looked in the lavatory for passengers. He saw Firefighter Kirk and Lt. Emmons clearing the aisle and assisting passengers. He said he asked for a Chicago entry tool (similar to a Halligan tool) from Rescue 11 parked at the rear of the airplane he said he got the Chicago tool and gave it to Firefighter Phillips.

When he entered the second time he saw more passengers on the right of the plane. He saw a woman sitting with someone he believed to be her husband. The passenger was in a seat in the center section on the right and was not ambulatory. The firefighter handed Lt. Brown the backboard and he and a police officer put her on a backboard. He slid the head of the backboard to Firefighter Saxton and she took that person out door 4L with the police officer. That was the last passenger to exit the airplane. There were large amounts of smoke filling the rear of the plane at the time Firefighter Kirk and Lt. Emmons were inside of the airplane. He had donned his SCBA. The plane was burning and started venting from the top at this time so he exited the right side rear of the airplane.

He assisted Rescue 10 by directing where their hose stream should be going over his radio. He had Rescue 56 reposition to the 1 o'clock position. He told them to be ready to deploy a handheld line. Firefighter Martin was the driver of Rescue 56. He stated that suppression operations were suspended because the squad was going in with a handheld line to search the

plane. They came out because there was too much fire. The squad had gotten the hose line off of Engine 33 located at the 7 o'clock position. They then continued ARFF operations.

He took command of Rescue 10, had it moved to the 11 o'clock position, and directed their hose stream. There was a lot of fire at the time. They knocked down the fires for the City Rescue Squad One to go back in to suppress residual fire. They got the handheld line off Rescue 56. He went inside through door 1R with a line and hit additional hotspots. The 1R door slide/raft was inflated inside the airplane. Rescue Squad Two was working from the tail to the center of the airplane looking for passengers on the second search. He was told to leave the airplane and standby. They left the handheld line inside the plane.

He was then called to the rental car quick turnaround facility for another incident. He then went by Fire Station 1 and got a case of water and a city radio. He took the city radio to the emergency operations center and gave it to Capt. Smerdel. He then returned to the site. He said they stood by as backup for the rescue squad that was doing the secondary search. They picked up hoses and equipment and then went with acting deputy chief Carnes to the emergency operations center. Then he went back to Fire Station 1 about 2000.

When asked if he had any recommendations based on this experience he offered that the response went as well as expected. Mutual aid was there right away but there could have been better communication between SFO, city units, and mutual aid. He felt they needed increased ARFF staffing. There were only 23 firefighters to handle 300+ passengers.

Interview: Mr. Kenneth Martin, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 14 July 2013, 1043-1119
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Shon Buford, San Francisco Firefighters Local 798
Present: Pete Wentz (NTSB), Randy Moseng (FAA)

Firefighter Martin had 13 years of firefighting experience, the last 8 years at SFO airport. Shortly before the accident he was conducting a pump transfer drill with Engine 56 and its crew (Firefighter Atwater and Lt. Brown) at Fire Station 2. Engine 56 was a Pierce firefighting vehicle with 1000 gallons of water and 350 gallons of foam. They had finished the drill and drove Engine 56 to Terminal 2 to get coffee. Firefighters Martin, Atwater and Lt. Brown heard the Alert 3 transmission over Martin's radio and returned to Engine 56 parked outside Terminal 2. They donned their turnout gear and proceeded toward the accident site.

Firefighter Martin drove Engine 56 from the terminal on taxiway B and turned left on taxiway F. He slowed as he approached runway 1L/1R and called the tower for clearance to cross. He was granted clearance and continued on taxiway F. Firefighter Martin could see the airplane on the left side of taxiway F with passengers evacuating. People were at the bottom of the slide/rafts directing them away from the airplane. He turned left at taxiway N and right onto runway 28L and continued down to the right side of the airplane. Firefighter Atwater got out and guided him into position, backing Engine 56 up across from door 2R on runway 28L. Firefighter Atwater and Lt. Brown proceeded toward the tail on the right side of the airplane.

Firefighter Martin put Engine 56 in pump mode and got out. He met up with Firefighters Lee and Plunkett who had come from the tail section of the airplane carrying a ladder. Firefighter Plunkett placed the ladder at door 1R and, along with Firefighter Lee, started donning their self-contained breathing apparatus (SCBA). Firefighter Martin pulled a handline to the 1R door area and charged the line. Lee and Plunkett climbed the ladder at 1R and fought the fire from the ladder. They then made their way into the entry way of 1R. Firefighter Martin activated the foam mode to add 3% foam to the water. He stated the smoke was thick and flames could be seen in the windows so he and Firefighter Hudson decided to retrieve Firefighters Lee and Plunkett from the airplane because the fire looked to be moving forward toward the cockpit. Firefighter Hudson was having trouble with his gear so Firefighter Martin ran around Rescue 11 and yelled up to Lee and Plunkett to get out of the airplane. Lee and Plunkett retreated out of the airplane and walked back to Engine 56 carrying the handline. Firefighter Martin then saw the airplane windows blow out.

Engine 56 was out of water so he drove to Fire Station 2 to refill the tank. He refilled the tank by himself and returned to the accident site. He pulled Engine 56 to the right side of the cockpit at the 11 o'clock position. He got out and retrieved the handline he left behind. He took the handline back to Engine 56, re-attached it to the engine and left the handline next to the 1R door as a safety line that had been requested by Lt. Brown.

He reported that his last live fire drill training was conducted in Denver in April 2013. When asked if he had ever practiced piercing with the penetrating tip of the Snuzzle he replied he had

practiced the day before with the nozzle in a window of a department training airplane, but he had not pierced the training airplane. When asked if he had any recommendations based on this experience he offered that training should spend a little more time discussing how to maneuver the truck around passengers and handlines on the ground. He also added that there was a lot of radio chatter during the accident that became confusing.

Interview: Ms. Rebecca Atwater, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 12 July 2013, 1045-1135
Location: Fire Station 3, San Francisco International Airport
Representative: Dale Carnes, Assistant Deputy Chief, San Francisco Fire Department (Airport Division)
Present: Courtney Liedler (NTSB), Emily Gibson (NTSB), Terry Smerdel (SFFD)

Firefighter Atwater had 14 years of service with the SFFD, the last 1 ½ years at SFO. She was assigned to Rescue 56 on the day of the accident (with Firefighter Martin and Lt. Brown). They were in the terminal participating in a drill when she received the notification. Part of the drill was to look for many different ways to exit the terminal. They exited the terminal the same way they entered, at Gate 59. She stated she was notified of the Alert 3 by an EMT and paramedic who were also in the terminal. She was later told that a police officer was the first to make the Alert 3 notification; however, she did not hear the police officer because she was on a different channel. She stated they took taxiways B and F to get to the site. When they arrived she saw people scattering - going in multiple directions. She stated there were multiple fire vehicles on scene when they arrived but could only recall Engine 33 specifically. They drove past the airplane and made a wide semi-circle looking for victims. They parked on the right side of the airplane forward of the wing next to the nose of the airplane. She did not recall what doors of the airplane were open. There was dark gray smoke but no visible flames and the roof had not yet vented. She remembered seeing water but not foam.

She heard over the radio there were four people still in the back of the airplane. She went to door 4L and walked into the airplane from the ground. There was one woman in the doorway. All she could see were her hands and legs and she was very close to the door of the airplane. They lifted debris off of her and two other firefighters pulled her out with a backboard. Once outside she was taken to triage. Firefighter Atwater returned to the back of the airplane and saw two firefighters removing debris off of another passenger who seemed to have a broken leg. They took the passenger out of the back (right side) of the airplane. They put that person in the grass near the tail. There were additional passengers in the back of the airplane. One was a man, the other was a woman. One of them was brought out on a backboard.

There were two other firefighters inside the 4L door who handed out a backboard with the last passenger. There was heavy smoke inside and it was getting worse. Three people were lying in the grass waiting for backboards. One of them, a small woman (who did not have a broken leg), was carried to triage where the ambulances were. She noticed that some passengers they were pulling from the airplane were not on backboards. There were many passengers on the ground who were also not on backboards. No one seemed to be arriving with backboards either.

She went back to Rescue 56 but it had left to be refilled with water. She waited 5 minutes, got down on one knee, and caught her breath. She tried to make contact with Lt. Brown twice when they went to refill the tank with water but did not get a response. She could hear everyone else on the radio. She was trying to find out if Engine 56 was coming back to the original placement. When the vehicle did come back it backed in near the left front of the airplane.

Lt. Brown motioned to her to bring a hose and nozzle to where he was at the nose of the airplane. The door was open. She handed the hose to a firefighter who carried it part of the way up the ladder and then handed it to a city firefighter inside the airplane. The hose was placed in deployment position, but not charged with water. They did not use it. They used a different one instead.

She went to runway 28L and picked up fire hoses and two SCBA bottles that were behind the airplane. She did not know how they got there. There was a lot of waiting. She was dispatched to a call at the rental car turnaround facility. At that time things were slowing down; there was less smoke and no fire but the firefighting efforts were still going on. After she returned from the rental car turnaround call, they went to Fire Station 1 to bring a case of water back to the site. There was also a request to bring back a radio from Fire Station 1 to the Emergency Operations Center in the terminal where people were gathering. She tried to radio her officer again to see where they should go upon return, but there was no reply.

There was a little back and forth discussion between the city fire vehicles and the ARFF vehicles when they were trying to extinguish the fire on the airplane. Some of the city firefighters wanted to use the handheld lines and some airport ARFF firefighters wanted to use foam, but the fire was mostly out at that point. When she came back to the scene with the water her crew was standing by waiting and there was some faint smoke from the airplane.

There were a lot of passengers on the ground but no backboards. Other people were asking for backboards on the radio and she did not hear a response to them. The backboards that were used were old and had no straps. She wondered where the SFO mass casualty supply van/bus was. She did not believe that it ever arrived.

When asked if she had any recommendations based on this experience she stated that backboards need to arrive sooner. She also felt there should be more people helping to get people away from the airplane. Because triage was a long distance away she felt it would have been better to have people closer to the airplane to receive the passengers rather than have them walk them the long distance with firefighters. She also stated that more drinking water should be available.

Interview: Ms. Elyse Duckett, Firefighter, San Francisco Fire Department (Airport Division)
Date/Time: 10 July 2013, 1543-1622
Location: Fire Station 3, San Francisco International Airport
Representative: Mr. Danny Gracia, San Francisco Firefighters Local 798
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA), Kathryn Reneau (FAA)

Firefighter Duckett had 25 years of service with the San Francisco Fire Department, the last 18 years at SFO. She was assigned as an ARFF vehicle rider the day of the accident, but was out food shopping for the fire station so someone had filled her spot. She left Fire Station 2 at 0945 to go shopping. She arrived back at the North Field Checkpoint at approximately 1130. She noticed an Airport Operations truck go by with its sirens operating. The checkpoint attendant seemed in shock. When Firefighter Duckett showed her badge and asked what was going on, she replied that there had been an airplane crash “here.” Firefighter Duckett could not see any smoke. Her first indication that something was wrong was the operations truck going by with its siren on, because she said “they never do that.”

At Fire Station 2 she saw Matt Wayne (the staging officer) and told him she was taking Rescue 37 (a relief vehicle) to the site. Rescue 37 was an ARFF vehicle equipped with 1500 gallons of water and 300 gallons of foam. She put on her equipment and responded to the crash location in Rescue 37. When she got to taxiway C she called the tower and asked for permission to cross both runways. She was later told everything had been closed but she did not know that until later when she returned to refill her vehicle and was told to cross at her discretion.

She arrived at the 2 o’clock position and saw Rescue 88 at the 12 o’clock position and Rescue 11 at the 3 o’clock position deploying foam on the fuselage using roof turrets. When she first arrived at the scene, she recalled seeing a lot of foam and some light gray smoke. She did not see visible flames. All of the vehicles were using full stream. She did not see any passengers when she arrived at the scene. She saw numerous firefighters, but no passengers.

She parked at 2 o’clock and deployed foam on the front section of the fuselage. The fire had not yet burned through. She heard a radio call for backboards and assistance. She applied foam to the roof. When she arrived, the 1R door was already open and Engine 44 had a ladder up to it. Firefighters were trying to lead a line in. She could see smoke building inside the airplane. She heard on the radio that there were no more passengers on the airplane. She saw gray smoke coming through the window. She saw the top of the airplane starting to change color and knew that the fire was about to burn through. She was still applying foam and there was a lot of smoke. She backed out because she could not see, maybe because the wind had changed direction.

She went to the left side of the airplane where the visibility was better. She moved to the 11 o’clock position and switched from foam to water. She saw flames coming out of the roof of the airplane. Battalion Chief Mark Johnson pointed to flames over the wings and said to knock it down. Battalion Chief Johnson also directed her to hit the rear of the airplane, so she turned the turret but did not reposition the vehicle. When she arrived at the 11 o’clock position, the

deceased passenger was already there and she believed the victim was covered with a yellow blanket. She knew this because Battalion Chief Johnson advised her there was a body, and she was guided out so as not to hit it. She used the roof turret and went through the windows (they were gone). She could see low flames inside. She ran out of water, so she went to refill at Fire Station 2.

When she returned she saw a grass fire burning that seemed to be “picking up speed” between taxiways N and P. She decided to extinguish it. After that she drove to the cart path area and parked next to it. She noticed that a city (mutual aid) engine from Station 15 was there. She got out of Rescue 37 and went to Rescue 9 to assist. She stated that “Rescue 9 was [in the position] I wanted to be.” She assisted Rescue 9 with positioning for Snozzle insertion because the slide/raft was in the way and they did not hit the victim’s body. The tip of the Snozzle had an infrared camera. They got it in the door and used the camera to see if there were any additional hot spots. They went in through the door near the wing. At the time mutual aid vehicles had arrived from the city. Incident Commander Captain Anthony Robinson asked her to take Rescue 37 back to Fire Station 2 and return it to service because they wanted to open runways 19L and 19R in order to get the airport back open.

She only refilled with water once. She was by herself the entire time. Everything on the vehicle worked. She was talking on fire control channel. Rescue 9 stayed at the scene. When asked if she had any recommendations based on this experience she stated that it would have been helpful if she would have been notified from the beginning that she could cross runways at her discretion.

Interview: Mr. Matthew Wayne, Firefighter, San Francisco Fire Department
Date/Time: 13 November 2013, 1620-1708
Location: Telephone Conference Call
Representative: Mr. Danny Gracia, San Francisco Firefighters Local 798
Present: Jason Fedok (NTSB), Emily Gibson (NTSB), Randy Moseng (FAA),
Asst. Deputy Chief Dale Carnes (SFFD)

Firefighter Wayne had 15 years of service with SFFD, the last 10 years at SFO. Previously he had been a rider on Engine 48 (a former airport ARFF rig that was replaced with the Oshkosh Strikers). He had also served as a driver of Engine 56.

Firefighter Wayne was assigned as the boat operator and staging officer on the day of the accident. He was sitting at the computer terminal in the hallway of Fire Station 2 when he heard the tones from the tower. The tone of the controller's voice was unusual as she said there was an airplane crash at 28L and smoke was visible. As part of his staging officer duties he immediately called Chief Carnes, Chief Dea, and Captain Tony Molloy to notify them of the accident. He put on his turnout gear and staging officer vest. He obtained six airport radios, a clip board, and a worksheet to keep track of equipment. He went outside to see if he could see the smoke and he could see it.

He went to "spot 41" near the Superbay and waited for incoming units. The ASOs provided escorts from the North Field gate. Three ambulances were first on scene and he held them at the staging area. He monitored radio traffic on channels FD-1 and FD-2. He waited for a while but did not receive any requests to dispatch vehicles. He made a radio call to command to ask whether he should send the ambulance and was told yes. It was his understanding that people were supposed to request units from him as they were needed. Other units from San Mateo County and more ambulances arrived and he got a bit overwhelmed. The ambulance supervisor came over and offered to handle the ambulances and he accepted. A battalion chief offered to assist with the county units.

Some vehicles were escorted to staging and others arrived with no escort; however, there were times they would arrive escorted and when the ASO would turn into staging the vehicles would just continue straight to the accident site. More vehicles arrived and some of them did not stop at staging. Others who stopped at staging "just took off on their own." He said there was not a lot of discipline. He thought that "basically people just wanted to go to the fire." He stated he did not know if they were being called by their battalion chief or getting direction from someone else. When he was holding the ambulances back he received some negative feedback from the crews, but he told them to "hold on" and that he could not let them enter the hot zone until he got "an all clear from the fire units." Some of the people left anyway but he did not know if they were getting orders from someone else. He stated that communications was a big challenge. He stated that having everyone on the same channel would have been good, and being able to distribute more radios and/or use less channels would have been beneficial.

Several city units arrived and the first people he recognized were Chiefs Murdock and Hale. More units arrived. He recalled seeing Chief Johnson at the staging area. The 6 radios were given out as they came in. He remembered giving them to Murdock, Hale, the ambulance

supervisor, a San Mateo battalion chief, and to Chief Johnson. At one point the incident commander asked for water supply and he sent 3 engines. He had placed his clipboard and paperwork on the ambulance supervisor's car hood and the supervisor had driven off. He stated the clipboard fell and all of his paperwork scattered so he gave up on the paperwork.

He was reassigned by command to launch the Moose boat. His duties as staging officer transitioned to boat officer. He handed off the staging officer duties to Greg Jones, a city captain, from Engine 39.

Firefighter McCoy arrived at the staging area and he drove her to the boathouse. The crew from Engine 39 helped them load the Moose boat with Scott bottles, regulators, life jackets, life rafts and walkways. He stated that the walkways were essentially flat life rafts that are hard and would not sink in the mud. They measured approximately 15 feet by 6 feet. The Moose boat was a rescue boat and a fire boat. It was a 44 foot long catamaran and had the ability to shoot water. A boat crew consisted of a swimmer, an operator, and anyone else who wanted to come. They launched the boat and searched the shoreline. There was debris in the water but no victims. He updated the incident commander and then went back to the MERF (Marine Emergency Response Facility) to secure the boat. While there a San Mateo County sheriff's office boat docked with debris they had picked up. He secured it in the boathouse until the FBI picked it up the next day. He did not recall when he finished with the boat. He stayed at the station overnight for his shift the next day. When asked if he had any thoughts or recommendations based on his experience he stated that he did not have anything to add.

Interview: Mr. Antenor Molloy, EMS Captain, San Francisco Fire Department (Airport Division)
Date/Time: 8 November 2013, 1303-1406
Location: Telephone Conference Call
Representative: Ms. Alicia Cabrera, San Francisco Deputy City Attorney
Present: Jason Fedok (NTSB), Peter Wentz (NTSB), Asst. Deputy Chief Dale Carnes (SFFD)

Captain Molloy was hired as a San Francisco firefighter in 1995 and was promoted to firefighter/paramedic in 2002 after 13 months of school and training. He was promoted to EMS captain in 2012. Saturday was not a normal workday for him. He was working an extra shift at the SFFD city communications center in downtown San Francisco when the call came in from the airport that an airplane had been involved in an incident. Another EMS Captain from the city called him to ask if he needed relief to respond to the airport event. The EMS Captain responded quickly to the communications center and relieved Captain Molloy who left downtown San Francisco about 1130. He responded Code 3 (lights and siren) to the airport in his duty vehicle and while enroute heard radio traffic that firefighters were looking for passengers at the seawall. He arrived at the SFO West Field gate around 1200 and was let through the manned gate. He proceeded to his office at Fire Station 1 to retrieve his handheld radio, badge, and turnout gear.

When he arrived at the scene he recalled seeing EMS Captain Stuart Beach and Firefighter Rick Wendland near the command post. Captain Beach was his predecessor at SFO and felt he had a good working knowledge of airport policy on such an event. Triage was set up on taxiway F. The SFFD airport paramedic unit was also at the passenger triage area. Captain Molloy recalled that “the most pressing need was to get patients moving.” He recalled a lot of passengers near the triage area but no buses to move them to the terminal. He made multiple requests to airport operations, the command post, and communications center that the SFO airport mass causality buses be brought to the triage area, but they never arrived. He personally made requests and he believed others did as well. He received acknowledgements of his request but never a response. Those buses were equipped with medical supplies including IVs, oxygen, backboards, tarps, tents, etc. It was his belief that airport operations was responsible for bringing those buses to the site. He believed one of the buses did respond to the terminal area for passengers later in the event but none responded to the accident site. When asked if the lack of buses affected their ability to treat passengers in a timely manner, he said he did not think so because of the redundancy of the vehicles that San Mateo County eventually arrived with – but it was hard to say. It was possible that it would have helped prior to his arrival but he was not certain. He did not recall requesting any specific equipment that was not available. The ASOs were transporting passengers in the bed of their vehicles to the triage area. He recalled up to 5 passengers “in the back of a Ford F-150.” He was monitoring airport communications channels 2 and 3 but communication was difficult - the best communication was face to face.

The San Francisco and San Mateo’s multi-casualty buses arrived early in his time on scene and provided backboards, tarps, and medical supplies. He was asked by Captain Beech, Firefighter Rick Wendland and San Mateo County ambulance supervisor Mike Marsh (from AMR) to organize the triage areas. He utilized the engine companies that had come from San Francisco

and started assigning them to each triage area. The red triage area was assigned to Engine 44, the yellow triage area to Engine 32 and the green triage area and walking wounded to Engine 9.

Captain Beach and Mike Marsh were organizing ambulance transportation. Captain Molloy felt they needed more help with transportation and reassigned paramedics from Rescue 91 to assist. “Everything seemed to start moving in a rapid fashion.” The red and yellow triaged patients were transported off the airfield in ambulances while four blue terminal buses and one ASO bus transported the green triage passengers to Terminal 2, Gate 91. Captain Beach sent a strike team of engines, AMR ambulance transports and EMS Captain Neal Tangherlini to the terminal area at Gate 91. He assigned Rescue 91 to remain on the airfield should any other medical needs arise and then he proceeded to the terminal area. At the terminal each passenger was re-triaged and checked for injuries or complaints. The passengers were then “brought through a pinch point so they could be tracked better.” They were sent down the stairs and through a corridor to awaiting ambulances. Passengers who needed medical attention were transported to local hospitals while the non-injured passengers were escorted to the United Airlines lounge. The tracking of passenger transport went on for hours. He recalled wrapping up at the terminal around 1730 or 1800.

He did not recall hearing about any injured patients behind the airplane or in the debris field during his time on-scene. Since the accident he had learned that some ASOs had discovered some people behind the airplane in the grass and on the runway with severe injuries. There was some difficulty getting that information to the command post and an ASO escorted ambulances directly to the injured and off the airport. He believed those patients departed quickly and never passed through the triage process. He also recalled helicopters transporting patients off the airfield. Two helicopters landed near the accident site. A Coast Guard helicopter transported two patients and a CalStar helicopter transported two patients. He believed their destination was Highland Hospital and Stanford Hospital, but did not know which helicopter went where. He believed AMR ambulance supervisor (contractor for San Mateo County) would have handled that.

When asked about the airport Redcap drills, he stated that they were useful for requiring people to identify themselves in different roles and thinking about the resources you would need. Airport Operations personnel were involved in Redcap drills but they did not respond with the emergency medical buses.

When asked to describe the triage process, he said that a triage team goes out into the field and triages people “as they lay” because there are insufficient resources initially to pick everyone up. The three criteria they are looking for is respiration, perfusion, and mental status. If people are able to walk they are classified as green and not too much time is spent on them. More time is given to those who cannot move – yellow and red patients. The initial triage needs to be rapid. As more responders arrive, litter teams are established who go out and look for red patients and bring them back to the treatment area. He believed litter teams were used in this case, but by the time he arrived most everyone had been brought to the treatment area. Both EMTs and paramedics can perform triage. The triage officer was Firefighter Meir Gordon initially. If a patient is not breathing an attempt should be made to open the person’s airway but if unsuccessful the person is classified “black” meaning “dead or expectant.” He explained that,

“in these situations we don’t have time or personnel to attempt to resuscitate somebody... in a mass casualty incident.” Generally the triage teams will update the triage officer periodically with a count of how many red, yellow, green, and black patients they have triaged.

He said there were obstacles in the medical area, but that they were overcome. Communications was the biggest obstacle. His recommendation for other departments was to continue to be vigilant in their training and to be prepared for a large number of patients.

Interview: Mr. Anthony Robinson, Captain, San Francisco Fire Department (Airport Division)
Date/Time: 07 November 2013, 1507-1547
Location: Telephone Conference Call
Representative: Ms. Karen Kirby, San Francisco City Attorney's Office
Present: Jason Fedok (NTSB), Asst. Deputy Chief Dale Carnes (SFFD)

Captain Robinson had almost 23 years of experience with SFFD. He had held several positions included being responsible for training all firefighters up to the level of EMT. He was promoted to lieutenant and sat on a committee when the fire department merged with the Dept. of Public Health. He was one of the initial rescue captains when that rank was formed.⁴ He was also in charge of the investigative services bureau for a few years. He came to SFO as a captain in March 2013. Prior to that, he had not been assigned to SFO or any other airports.

He was on McDonald Street traveling from Fire Station 3 to Fire Station 1. He did not hear the initial alert because that just goes to the stations. He got the alert over his portable radio on FD-1 from fire control who told him there was an airplane down on the 28s, a 777, and the number of passengers and crewmembers. He was stunned but drove to the North Field gate. He knew it was serious when he arrived at the gate and it was open and the police patrol officer was waving him through. When he got closer to the 28s and cleared a hangar he could see the smoke and an airplane down. He was about to call ATC to cross the runway 1L and 1R when ATC called him and told all EMS personnel that the runways were closed. He did not recall whether he requested mutual aid or whether it was prompted from fire control but he did make the request for mutual aid from San Francisco and San Mateo County. He usually did not like to request the 101 and 303 boxes until he could see what was happening, but he could see the smoke and made the request.

Upon arrival he positioned himself about 100 yards from the airplane and upwind. He wanted to leave enough room in case the fire really got out of control. The location ended up being "perfect." He saw that the tail section had been ripped away, one engine was missing, 2 slide/rafts were deployed on the left side of the airplane, and survivors evacuating. He immediately requested several shuttle buses come to his location because he knew they would be dealing with large numbers of passengers. At least 2 ARFF vehicles were on-scene when he arrived. One vehicle was on the right side of the airplane doing fire suppression and cooling the fuselage and the other was on the left side of the airplane protecting the exits for people who were evacuating. He estimated that within two minutes of his arrival on-scene, all of the airport units had arrived. Lt. Monteverdi was assigned as fire operations command who was making tactical decisions about the firefighting operation and he reported directly to Captain Robinson.

He made contact with Rescue 88 and got an update on what they were doing. An ASO and a police officer reported to his location and offered to give him any assistance he needed. He communicated with an engine company who told him they were going to board the airplane. When they got inside, they told him they needed assistance because passengers were trapped. He responded that he would send in mutual aid once they arrived on-scene. He set up staging

⁴ Chief Carnes later explained that a rescue captain is equivalent to a paramedic supervisor.

near Fire Station 2 and requested ambulances report directly to the scene while engines and truck should stay at staging until they were called for. He directed Rescue 91 or 93 to set up the medical group so they could begin tracking survivors. They set up a triage area. A short time later Rescue Captain Stuart Beach arrived from San Francisco and took over that position. Later the SFO medical group supervisor, Rescue Captain Tony Molloy, arrived and took over.

After about 20 minutes, passengers had been extricated from the airplane and were waiting for ambulances. A San Mateo County chief arrived at the same time as a California Highway Patrol officer who told him they had a helicopter that was going to be assigned to him and needed a place to land. He had the San Mateo County chief handle the establishment of a helipad. The Coast Guard later arrived and also offered a helicopter. San Mateo County ambulances arrived and he directed them to the back of the airplane with longboards to help get the extricated passengers to triage. A few minutes later mutual aid arrived from the city – Division 3. He was still right next to his vehicle and provided a briefing with a lot of information to the division chief that ARFF units were controlling the fire, firefighters had entered the airplane and extricated passengers, and that there was no one left on the airplane. He also stated that they had not checked the debris field or water yet. He asked Capt. Robinson to launch a boat into the water and he contacted staging and had a boat deployed. The boat eventually found no one in the water. He transferred command to Division 3 and started working with Chief Johnson who had been assigned to fire attack. His main role was serving as a conduit between Division 3 and Chief Johnson to the ARFF units because they could not communicate directly. Later he went back to the command post area and Chief Johnson began dealing directly with ARFF units.

About 30 minutes later Chief Johnson reported to him that there was a victim in front of the left wing who appeared to have been contacted by one of the airport ARFF vehicles. Capt. Robinson went to that location and agreed that may have happened. He immediately reported that information to Deputy Chief Gonzales and he believed he passed the information to either SFPD or the FBI. They were told to control that location and keep all the units there. The fire was pretty much out at this point. Firefighters needed food and water and he handled the logistics for that. He went back to the fire station between 1930 and 2000.

When asked about his biggest challenges he stated that, even though all of their resources were deployed, initially they needed more help. Although he had not been at the airport a long time he felt prepared when driving up to the accident site. He “just started doing the things that needed to be done.” He stated that the amount of airport equipment was fine because they had almost extinguished the fire prior to the arrival of mutual aid. When asked about sufficient water and foam supplies, he said they had anticipated the need for refilling. The morning of the accident they had a drill in which he found that the ARFF vehicles had about 3-5 minutes of “constant flow” before they ran out of water. Refilling was not a problem because there were two other vehicles to shoot water while one was refilling. When asked about communications he said they were adequate. He mainly communicated with his units and fire control. He was not able to communicate over the radio with Division 3 but was mostly standing nearby for face-to-face communication. He did not give them radios but thought that the mobile command post might have had radios in it. Staging could have gone better. He stated that what was supposed to happen was that responding trucks and engines were supposed to have stopped at staging while

ambulances and chiefs were supposed to report directly to the scene. Some engines and trucks bypassed staging but they were able to keep them in an area where they did not cause a problem.

When asked if he had any comments about his experience he stated that the flight attendants were crucial to the success of the incident. They were the last ones off the airplane and were helping to rescue people trapped by slide/rafts inside the airplane. He “tipped his hat” to all of the SFO firefighters who were on the on the scene because they operated like clockwork and did not need to be told what to do. He was proud to be part of the organization.

Interview: Mr. Tom Siragusa, Assistant Chief, San Francisco Fire Department
Date/Time: 16 July 2013, 0920-1102
Location: Fire Station 3, San Francisco International Airport
Representative: Declined
Present: Peter Wentz (NTSB), Randy Moseng (FAA), Capt. Terry Smerdel (SFFD)

Chief Siragusa had 36½ years of experience as a firefighter, the last 31½ with the City of San Francisco. He was working at the Division 3 Firehouse 7 located at 19th and Folsom in downtown San Francisco and had just concluded a meeting with the other fire chiefs. There were no fire apparatus in the firehouse at the time. The main phone line was ringing and he answered it. It was the city communications center and they told him that there was a hard landing at SFO and the slide/rafts were deployed. He did not recall the name of the caller but the alert tones went off at that time. He and his driver got in a vehicle and proceeded to the airport via the freeway. His driver was Incident Support Specialist Carol Conley-Boden, one of five incident support specialists in the department. She was tasked with managing the command post and documenting assignments, as well as keeping track of accountability. He found the clipboard with the checklist on it for airport response kept in the vehicle and reviewed it in order to organize what to do and who to call. Checklist 1 contained information about communications and switching over to C9 channel and the direct channels to communicate with the airport fire department. It also had directions to the checkpoints at the airport. Checklist 2 had a map of the airfield and a list of the same numbers as Checklist 1. He tried to get a hold of the captain on duty from his cell phone but the call went unanswered.

The response was initially a first alarm that involved 3 engines, 2 fire trucks, a medical vehicle, 2 battalion chiefs, the rescue squad, and him. He considered it a normal response to the airport except for the slide/rafts being deployed. He stated that the response was usually cancelled en route. He communicated with the city communications center and reminded them to have all companies switch to C9 and to turn the repeater on. He told her to have SFO turn the repeater as well. He tuned his SFFD radio to the C bank but he could not find C9 because it was not labeled. The radio shop had just reprogrammed all the radios and it took him about 20 seconds for him to realize there was no C9. He contacted the city communications center to cancel the response on C9 and told them to switch to A6 - that would be the new attack channel. He explained that there were three banks on a radio - A, B and C. There used to be a C9 radio channel but it had been recently changed to Cal Fire 2.

At that point he stated that he had no information of the incident. Chief Siragusa did not call for additional units from the City of San Francisco nor did he call a yellow or red alert because he did not know the extent of the situation at the airport. He also did not get any information from the Captain Anthony Robinson. He was still on the 101 freeway just past Candlestick Park when he got a report from the city communications center that there was no fire on the airplane but that there were injuries. He considered if they should start dispatching more medics to the site. At the time he thought that the slide/rafts were deployed and that people were evacuating the airplane so he said, "give me two ambulances." When he got by South San Francisco his driver asked if she saw the smoke near the airport. He looked southeast about (1.5 miles away) saw a light smoke column. He was not sure what it was because there are a lot of industrial buildings in that location. He asked the city communications center if there was fire with this incident and

they replied that they had no information of fire at the time. The city communications center then asked a unit on the scene if they saw smoke and the unit replied, “yes, there is a column of smoke.”

He also stated that Battalion Chief Ed Dea gave him very little information when he got on scene. Because of the magnitude of the incident he needed to be provided with the information on what resources were needed at that time.

He stated that as he approached the airport he began to realize the size of the airplane incident, so he told communications to call a yellow alert. A yellow alert notified the hospitals that they may have multiple patients. The first four patients go to SF General Hospital then two to every other hospital on the list. That process is then repeated for all 11 – 12 receiving hospitals.

He went to the North Field Checkpoint and looked southeast. He saw smoke and the conditions had changed - the smoke was getting gray and blacker. At this time he requested a second alarm from SFFD. A second alarm provided 5 engines, 1 truck, a battalion chief and a rescue captain. There was a yellow escort vehicle providing escort to other units and the driver waved to him to follow. The escort took them to the taxiway near the staging area and he continued in his command vehicle to the crash site. He wished he had assigned the engine companies with paramedics to do medical triage instead of the companies with just EMTs. No fire personnel greeted them or gave them information at the North Field Checkpoint. Someone was usually at the North Field Checkpoint to provide them radios but no one was there so “we took independent action.”

As a yellow ASO vehicle escorted his command vehicle onto the airfield he saw the incident about a half-mile away. He recalled moderate smoke and a downed airplane. A couple of medical EMS units were to the left of the airplane and passengers were in the grass on the right side. His driver parked the vehicle about 400 feet away from and at the 11 o’clock position to the airplane.

He stated that San Francisco International Airport was in San Mateo County. He believed that the county paramedic supervisor was doing the same thing he was doing – but just for the San Mateo County. He stated he would have liked to have had a medical branch director to go between the city and county because they were doubling their effort.

To his left he saw medic units and people at the edge of the grass. He looked back and saw four ARFF vehicles. He saw airport units applying foam and people evacuating. He saw fire at the windows at the front third of the airplane. It was surreal and when he got confirmation that people were injured he realized he needed a red alert. He called a third alarm which provided 4 engines, 1 truck, and a battalion chief and a medical unit.

The smoke was on the opposite (east) side of the airplane from him and looked to be grayish and under pressure. The ARFF vehicles were foaming the fuselage and the airplane. People were walking over to the triage area. He was parked about 125 yards away from the airplane at the 11 o’clock position. The San Mateo County chief also parked his vehicle there. He contacted Capt. Anthony Robinson to “get on the same page” as San Mateo Battalion Chief Charlie Barringer.

Capt. Robinson told him that they pierced the fuselage and they were getting the passengers off the airplane. He then met with Battalion Chief Barringer who also briefed him. He set up unified command with San Mateo County. Within 90 seconds of doing a transfer of command from Captain Robinson there was an explosion in the airplane that was felt at the command post.

Mark Johnson was the first battalion chief at the airport from the city. Chief Barringer was helping out with medical group supervisor and getting people off the tarmac at the triage treatment and transport area. He told Chief Johnson that he was in charge of fire attack and to keep rescue and ARFF operations coordinated for fire attack. He said that Chief Johnson coordinated and advised him of the ongoing situation.

San Francisco City Rescue Captain Stuart Beach arrived right after he did. Captain Beach had checked in with him and Chief Siragusa told him to get a handle on the resources needed to coordinate with San Mateo EMS. AMR's Rescue Captain Mike Marsh was stationed 15 yards behind the command post and he told Captain Beach to keep in communications with AMR. He told Ms. Conley-Boden to have the city communications center get all rescue captains to the airport because it was a mass casualty incident. At this time he realized that the most important thing was medical response.

He had put Chief Johnson in charge of fire attack because he was the most knowledgeable about this type of fire. Chief Johnson was a pilot and was an instructor for tank fires and Texas oil fields. He also knew about foam and ARFF operations. He was fortunate to have Chief Johnson to provide the information needed. Chief Johnson told him that he needed an engine to help with the extinguishment of the fire. He assigned Engine 15 to check in with fire attack. He also sent Truck 17 to check in with fire attack to help with extinguishment.

Captain Robinson was running the airport SFFD personnel for firefighting operations, Captain Barringer was running the San Mateo fire and rescue, Chief Johnson and rescue Captain Beach were fire attack and EMS. Beneath Chief Johnson with fire attack was Lt. Mike Gonzalez with Truck 17. They assigned two other engine companies (one was Engine 23) to shuttle water to the crash site. Other companies were assigned to the medical groups. A red and orange helicopter landed north of the command post to pick up patients. He was told that a California Highway Patrol helicopter with the FLIR was searching the water for victims.

In the first 5 to 10 minutes two uniformed flight attendants came over to him and he tried to find out about how many people were on the airplane. One of the flight attendants had a paper which he believed to be the manifest. The flight attendant told him that the 4 crewmembers were missing. She stated that the crew members were sitting at the rear of the airplane and they did not know where they were. She then told him that there were 290 passengers, one infant, 12 cabin crew, and 4 pilots on the plane for a total of 307 passengers. He contacted Captain Robinson and Chief Johnson and told them that 4 flight attendants were missing and he should search near the aft of the airplane by the galley area.

He then noticed the back of the plane was missing. He could not see where it was and he needed to account for four people who were missing. Chief Johnson said he checked the aft of the airplane for the four flight attendants and they were not there. He was again told by the flight

attendant that they were not accounted for - but Chief Johnson again assured him that there was no one on the rear the plane.

Chief Johnson then asked if he could assign an engine to him to help Engine 15 with water transfer. He assigned Engine 23. He explained that, being from the city, they do not have to worry about water supply the way we have to at the airport. He saw an ARFF vehicle drive away. He asked Captain Robinson where it was going and he stated to get water. He then requested the hose tender vehicle which carries one mile of hose. It arrived but they never used it. It remained in the triage area. It came from Fire Station 22 at 16th and Irving in downtown San Francisco.

His major objective was to coordinate San Mateo and San Francisco units. When he saw the airplane he feared that there would be deaths and said it was difficult to get his head around it. He told Rescue Captain Beach and EMS San Mateo to keep track of the number of patients they were moving and where they were going. The fire chief and the deputy chief of San Francisco arrived on the scene and asked for briefing of the incident.

The flight attendants were still at the command post. A female flight attendant would not give him the manifest but she did give the names of people still missing. Several minutes after the majority of the fire was extinguished Chief Johnson communicated to him that fuel was leaking from the left wing. ARFF units were still working at the time. He told Chief Johnson that if he thought it was a real problem that he should remove the crews. Chief Johnson replied that he felt it was okay for now.

Chief Siragusa was trying to account for all the passengers including what their conditions were and where they were located. He checked with San Mateo County for information on patients and told them to send the victims to the west side of the airplane. He was getting information that people were coming out of the water and he wanted to confirm that. He called for the SFFD airport boat, San Mateo County boat, and the fire boat from downtown San Francisco. He then instructed the SFFD airport fire boat to coordinate a search of the water for any victims. He also used the highway patrol helicopter with their FLIR to look at the water for victims. None were found.

He said he was in the command vehicle and tried to determine if another search of the plane was necessary. Chief Johnson was walking from the plane to the command position and told him he saw a victim near the left front side of the plane and it looked like it had been run over by a vehicle. Within seconds he said he shared that information the deputy chief and Chief Hayes-White. The SFPD started its investigation. The mobile command unit showed up 1 hour into the incident. Also at about that time San Mateo informed him of a deceased person who was on the runway. The San Mateo County Coroner arrived on-scene 1-1/2 to 2 hours into the incident.

He called Rescue Captain Beach over to his location and told him to keep track of the number of transported people. In the next 10 to 12 minutes they began getting numbers of passengers. As focused as they were on getting an accurate count, the numbers were off by 60 people. He had notification of one deceased person on the airfield but they were still missing 60 people. He told Chief Johnson about the 60 missing people and that they needed to search the airplane again

from the point of impact to the site. He also told Battalion Chief Barringer from San Mateo to check his count of passengers. Chief Johnson had the airplane searched and no one was on it. Chief Siragusa then thought that they might have been missing triage tags from passengers who had already been transported or that U.S. Customs had taken some passengers. He was provided new information around 1800 that the 60 passengers were not missing. He found out that U.S. Customs had picked them up and relocated them.

Chief Siragusa saw people running back from the collection point to the airplane. Sgt. Pera from the SFPD was the highest ranking officer on the scene and he asked him what was happening. Sgt. Pera said he would handle it. By that time, the flames were extinguished but the fire was not yet completely under control.

The media wanted information from Chief Hayes–White. He told her not to be specific with the numbers and that the airplane was checked and cleared. He said to offer that the manifest showed 307 passengers on the plane. Some individuals had been transported while others were still on the scene. He was in the International Terminal at the EOC with Chief Hayes–White, the Chief of Police, Mayor Lee, and Asst. Deputy Chief Carnes. He stated he went to the EOC and the SFO operations people were giving a briefing and they shared a video of the crash. They then went to the press conference. He stated he was brought in on the tail end of the meeting before the press briefing. After it was over, SFFD and SFPD chiefs, NTSB and FBI personnel returned to the accident site.

He reported that communications were good and he had the ability to communicate from his radio to all San Francisco city units, San Mateo and EMS. SFO operations, Chief Barringer, and Captain Robinson got him the other information he needed.

When Chief Siragusa was asked if he was involved in any large-scale drills at the airport and he stated that he had not. When asked if he had any recommendations based on this experience he said that he needed experienced chief officers from the airport [on duty 24/7] to provide more information while en route. He believed a red alert should have been called by the chief SFO officer. Mass casualty incident, treatment, transportation, and medical group supervisor responsibilities needed to be tightened up. Some people were transported off the airport who were not injured. A checkpoint for passengers leaving the airport needed to be established to check everyone as they leave. The command post should have been isolated so interruptions could be kept to a minimum. People were too close to command post. He had no idea what was behind the airplane closer to the seawall because he could not see the area from the command post. He needed a scout to report to him. The existing mobile command vehicle was inadequate at best. The command vehicle needed a video feed of the airfield. Engine companies that were assigned to assist with medical treatment should have been paramedics, not EMTs.

Interview: Mr. Mark Johnson, Battalion Chief, San Francisco Fire Department
Date/Time: 07 November 2013, 1320-1410
Location: Telephone Conference Call
Representative: Ms. Karen Kirby, San Francisco City Attorney's Office
Present: Jason Fedok (NTSB), Asst. Deputy Chief Dale Carnes (SFFD)

Battalion Chief Johnson had almost 23 years of experience with SFFD. He was chief of Battalion 10, one of the five battalions in Division 3 – which covered the south side of the city. (Division 2, with four battalions, covered the north side.) Battalion 10 was made up of 5 fire houses. He had previously served on a rescue squad, had a HAZMAT certification, and had taken many incident command classes. He was also involved in software development for incident command and fire simulation. He also taught a course on incident command and pre-planning for civil and industrial firefighting. He also stated that he was a commercial pilot with approximately 3,500 of flight time – mostly in helicopters. He had never been assigned to an airport during his career.

He was visiting Station 25 on 3rd Street when he received the notification of an airplane crash from city communications. They occasionally got calls for airplane events at the airport but it was not an everyday occurrence. He was close to the freeway and immediately responded to the airport. Prior to departing from the station he instructed the officer there to activate the mass casualty unit at the station and respond with it. While enroute he contacted Chief Siragusa (Division 3) and notified him about the mass casualty unit he had activated. He saw the column of smoke and drove to the North Field gate as he had in previous responses. They did not receive any radios or communication equipment at the gate, nor was he expecting to receive one. His understanding of the airport's emergency response plan was that they would receive such equipment when they got to the scene of an incident. They were met by an ASO vehicle and followed it to the airplane. They did not go to staging. Upon approach he pulled out of the line and drove to the command van. He got out of the car and met with Chief Siragusa, who was also arriving, and Chief Williams from Battalion 9.

Captain Robinson gave them an initial briefing. He said that the airplane had been searched and no one was left on the airplane. He thought the briefing was "very good and succinct." It was clear and answered the questions he needed to begin his duties. There was a short discussion about what communication channel they should be on. The standard procedure was for the city units to switch over to C9 but when he did that he was not able to talk with anyone. Chief Siragusa had the same experience so they switched to C14. It "wasn't even a speed bump." He stayed on C14 for the duration of the event and had no difficulty. He did not know if airport firefighters had access to C14, but provided face-to-face instructions with ARFF drivers throughout the event because he could not talk to them on C14. He would have preferred to be able to talk to them on the radio but they adapted and moved on. Chief Siragusa then took over incident command and assigned him as "fire attack" and he walked over to the airplane.⁵ As "fire attack" he had control over the airplane and all aspects of the firefight and everything around it – including patients nearby the airplane. He initially considered that he was in

⁵ Regarding transfer of command, he stated that there is often a radio call when that transition takes place, but that the radio call sign "command" was assigned to whoever was IC. Therefore, it was not of much consequence that a particular operator may not know exactly when the transition took place.

command of the entire wreckage field but later broke off a secondary group to the tail section of the airplane. He stated that it all comes down to how many resources are available and how to prioritize things. He stated his “number one priority was about patients – how many victims were down and where were they and getting a good accounting for them.” He estimated that he ordered a search of the area around the airplane within the first 10-15 minutes – likely right after he saw the victim in front of the left wing. He said he also sent two companies and a rescue squad to search the debris field back near the water after hearing there were four people missing (who he believed to be crewmembers).

There were vehicles at the 12 o’clock position, the 9 o’clock position, and one just pulling up to the 6 o’clock position. He saw some victims being carried from the airplane and he asked the firefighters how many more passengers were in or near the airplane. He thought they told him there were three or four more. He called for additional people to help with those patients. The vehicle at 9 o’clock left to refill with water and he recalled that the vehicle at 6 o’clock was shooting foam at that time. The foam was not quite reaching the fire so he opened the door and told the driver to adjust his attack. He walked back toward the front of the airplane. He noticed that there was a great deal of fuel coming from the left wing where the engine was supposed to be. It was coming out under pressure from a 3 to 4 inch pipe. He recalled an explosion from the airplane which was “one of those ones you feel” and said the fire’s characteristics changed a bit after that.

They were sending him resources and those who arrived on foot he directed to help carry victims out. Engine 15 was the first vehicle that arrived. It was equipped with foam but they were not able to shoot it the way in which he wanted so he assigned 15 to cover the fuel leak. The ARFF vehicles returned but he wanted to search the airplane again so they tried to do that between their master streams being turned off and on. He got a report of additional people missing and attempted to ascertain if they were passengers or part of the crew. He got the impression that they were part of the crew and thought it might be the pilots so he assigned a company (Rescue 2) to search the cockpit. They put a ladder at door 1L to get into the cockpit. He tried to coordinate with the ARFF vehicles and direct their streams the best he could and had them stop when he wanted to put people inside. He did this face-to-face because he could not communicate with the drivers via radio. It was not optimal, but it worked.

When the flames were finally knocked down he had another report of people missing so he assigned some personnel to go into the aft of the airplane. At one point an officer from Engine 15 showed him the body of a victim near the left wing and he had the body covered. He notified the command post shortly after that.

Overall, he felt that everything went very smoothly. It would have been nice to have a water supply, but he could not think of any challenges he faced. When asked if he felt comfortable fighting an airplane fire even though he no previous experience working at an airplane he replied that he was very comfortable with the role he was assigned.

He stated that the fire was extinguished by one of the vehicles with a HRET. He did not direct the airplane to be pierced. There were at least two piercing holes in the fuselage by the time he arrived. He did try to direct the vehicles movement so none of his firefighters were struck. He

did that face-to-face. When asked about the victim near the left wing, he stated that he was not told about the victim until the body was pointed out by another firefighter. He said he was probably 15-20 feet away from the body but that it was covered by a lot of foam. He had the body covered but not moved because he knew someone would be coming in to do an investigation.

He did not have any interaction with SFPD other than having some assistance brought over to help two officers who were helping carry a victim. He went into the airplane twice after the fire had been extinguished to look into the cockpit and to ascertain if someone had found a body inside. He explained that it was a standard operating procedure to command interior searches for victims in any kind of fire – even though they may have already been told that there was no one left inside. They double check and triple check just to ensure that no one has fallen or been trapped in an area that is difficult to see. He recalled seeing two helicopters fly over and was told that one took a patient to Stanford. He had not been involved in any of airport's annual tabletop mass disaster exercises. He was unsure whether anyone from the city attended those. He confirmed that he was wearing a personal video camera on his helmet during the response. He explained that he had been the fire attack chief during a fire a few years ago when two firefighters were killed. From that experience he saw the value of having a camera because a lot of questions from that event went unanswered. He had been wearing it for a year and a half. He stated there no department policy at the time about wearing those kinds of devices prior to the accident. There was a policy in place about cameras in department facilities which he believed had been extended to helmet cameras since the accident.

When asked for any overall thoughts about this event he stated that he was impressed with what happened during the accident. He felt everyone came together well and did what was expected of them.

Interview: Mr. Dale Carnes, Assistant Deputy Chief, San Francisco Fire Department (Airport Division)
Date/Time: 06 November 2013, 1400-1546
Location: Telephone Conference Call
Representative: Ms. Karen Kirby, Assistant Chief Trail Deputy, San Francisco City Attorney's Office
Present: Jason Fedok (NTSB), Dr. Evan Byrne (NTSB), Randy Moseng (FAA)

Assistant Deputy Chief Carnes was in charge of the Airport Rescue Division. He had been with the San Francisco Fire Department (SFFD) since 2002. He had been a professional firefighter since 1985 and he came to the SFFD as a lateral transfer from the City of Las Vegas Fire/Rescue. He made lieutenant in 2008 and was immediately assigned to the SFO airport division. He made captain in 2011 and was shift captain at SFO. In 2012 he transferred back to a variety of assignments in the city and on July 1, 2013 was promoted to assistant deputy chief at SFO. His predecessor in his current position was Assistant Deputy Chief Mike Morris who left the position due to retirement.

Chief Carnes described the command structure in SFFD. The airport fire department is a division of SFFD. All of the personnel there were employees of SFFD and everyone had a minimum of 5 years of experience in at SFFD before being allowed to request transfer to the airport. Chief Joanne Hayes-White was the city fire chief. She had two deputies: Deputy Chief Mark Gonzales was deputy chief of operations; Deputy Chief Ray Guzman was deputy chief of administration. The next level down in the rank structure is Chief Carnes' level – the assistant deputy chief level. That rank was an administrative chief's position – such as the airport, support services, fire marshal, division of training etc. Parallel to that rank on the operations side was the rank of assistant (division) chief and they had 2 assistant chiefs on duty every day for the city. The next rank down was the rank of battalion chief and they have 9 battalions in the city. From there it went down to captain, lieutenant, firefighter, and firefighter paramedic. They do not have an engineer or driver operator rank – all of the firefighters are trained as driver operators at the academy and in their probation, so it is a seniority basis for that position.

His direct supervisor was Deputy Chief of Operations Mark Gonzales. Below Chief Carnes' in the command structure at the airport was his training Battalion Chief Ed Dea, who has one firefighter who was a training specialist working for him. Then there were 3 shift captains,⁶ one on duty every 24 hours, and they were in charge of the shift and will serve as the initial incident commander if anything happened during a shift. Each of the 3 stations has a lieutenant or acting lieutenant on duty supervising the crews in each station. On the day of the accident the shift captain was Anthony Robinson. Battalion Chief Ed Dea responded as the Rescue 2 call sign but he did not take command from Captain Robinson upon his arrival on scene.

Chief Carnes stated that he worked a 40 hour work week and it was his day off. He was at home in the East Bay area mowing his lawn when he was notified via telephone by his boat operator

⁶ Captain Smerdel (a member of the NTSB Survival Factors group for this investigation) was one of his 3 shift captains at the time of the accident. He was off duty at the time of the accident but came in after the event happened. He had since transferred back to the city and was now captain of Engine 15.

about the Alert 3. Per their procedures at the time, it was the boat operator's responsibility to provide him with alert notifications. Chief Carnes was notified that an Alert 3 was in progress with an airplane on ground, working fire, and victims. He responded from his home "code 3" in his department vehicle. He believed he was notified not long after the Alert 3 went out, possibly within 3-5 minutes of the crash. It took about 40-45 minutes to arrive at the airport – with his arrival sometime about 1200-1210. As he was coming down Interstate 101 toward the airport he was contacted by Chief Dea on the phone, who was on the scene. Chief Dea stated that the airport EOC (emergency operations center) was requesting an agency representative so Chief Carnes went there. He said the EOC was located in Terminal 2 on the departures level adjacent to the SFFD communication center that dispatches fire, police and airport operations.

By the time he arrived, all victims were off and the fire had burned through the top of the fuselage and the mutual aid companies were already on scene. Chief Siragusa had established incident command. Chief Carnes was at EOC for about an hour handling his duties there, including one press conference at request of airport administration. Eventually Captain Smerdel initiated recall of off duty personnel and he relieved Chief Carnes who went down to the accident site. By the time he got to the scene the fire was out and the incident was pretty much mitigated.

Chief Carnes described the some of the changes that SFFD had made post-accident:

- Creation of a draft policy on the cameras on the 3 Striker 4500 vehicles so they are on and cannot be deactivated (switch is in the locked position with keys removed and in a lock box in the automotive shops at the airport).
- Creation of a draft standard operating procedure in conjunction with the city attorney's office and SFPD on retrieval of footage to maintain evidentiary value for anything from an Alert 3 to a vehicle crash on the airfield.
- Brought in a company named Eagle Eye, who was the provider for the Driver Enhanced Vision Systems (DEVS) on the 3 Striker vehicles to complete the installation process to ensure the DEVS systems were up and running.⁷ Eagle eye also provided an 8-hour training course for all personnel on the operation of the system.
- All airport fire personnel attended a 40 hour basic ARFF course at DFW Fire Research Training Center with live burn.

He stated that they were in various levels of completion on other things, including:

- Formal incident command training for captains, lieutenants, and other personnel who are qualified to serve as acting lieutenants. Other personnel to get certification in the blue card system as type 4 and 5 incident commanders.
- Established a policy and procedure committee and are formalizing administrative and operational procedures for the division
- Bringing in an accountability system, called the passport system which is a NFPA compliant and nationally-recognized system for hazard zone accountability. It included

⁷ The vehicles had a full DEVS system with the full tracking camera, FLIR, and an airframe resource library. The FLIR data was not downloaded.

helmet fronts that have Velcro panels to clearly indicate which apparatus or equipment an individual was assigned to. It also included name tags assigned to a “passport” assigned to apparatus which can be turned over to the incident commander on scene to ensure complete tracking of whoever is assigned to that incident.

Additionally Chief Carnes stated he was working very closely with the Dallas Fort Worth (DFW) ARFF training center who provided curriculum and lessons plans for the 40-hour ARFF course. Once SFO obtains approval from their FAA inspector, they will be using that curriculum in-house and will do the live burn training at DFW. He also received DFW’s HRET curriculum and driver operator programs and will be looking for approval from their FAA inspector. In the area of triage and patient tracking, SFO will be using the same program as San Mateo County known as the EMT3 program. This will ensure that the same tags for patient tracking (a bracelet with bar codes for electronic tracking of victims) are used both at the airport and in the county. The rest of SF county EMS was evaluating a program so they would have a much more seamless transition in event of another mass casualty incident.

Chief Carnes stated that a lot had been accomplished in the communications area as well. This included having completely redone their communications plan, and working with the city dispatch and the SFO dispatch center so that they now have the ability to patch units responding from city and SF county into the command and tactical frequencies at the airport so they have much better communications on scene. Lastly, Chief Carnes had become a member of the San Mateo chief’s association to build relationships and get into the area of strategic planning for mutual aid training for San Mateo County and the units at the airport.

Chief Carnes clarified terminology used by fire personnel during the accident response.

- The term “fire control” was synonymous with “dispatch” and referred to the fire portion communications center next to the EOC.⁸
- When the term “operations” was used over a frequency the speaker was likely referring to Lt. Monteverdi, who assumed fire operations on-scene beneath Captain Robinson who was the incident commander. (He said one caveat to that was the airport safety officers are sometimes referred to as “ops.”)
- “Command” referred to the incident commander on scene. Captain Robinson was IC until resources from the city arrived.
- “101 and 303” referred to box 101 and box 303. Box designations classify and describe resource elements when they dispatch. For example, Box 101 would be a mutual aid assignment from city (3 engines, 2 truck companies, rescue squad, a battalion chief, assistant chief, paramedic supervisor and one or two ambulances). Box 303 is a like-sized response from San Mateo County. In order to request those, airport fire control would have to contact city dispatch for 101 and San Mateo County dispatch for 303.
- “Yellow or red alert” – Those terms classify mass casualty incidents in the city/county of San Francisco. Yellow alert was the potential for 10 or more casualties; and red alert was confirmed 10 or more casualties. He was not certain whether 10 was the exact number in the protocols but could provide that information later. EMS certification and protocols

⁸ If used by a non-airport city firefighter, they were likely referring to city dispatch.

are within city and county of San Francisco. The airport firefighters are an asset of city/county of San Francisco so they use the same protocols as if working in SF city or county even though they are in San Mateo.

- “Alert 1, Alert 2, Alert 3” – Those terms classify levels of an aircraft incident. An Alert 1 is an in-flight emergency which if left unchecked would not necessarily impact the crew or the aircraft. Alert 2 would likely impact the crew or aircraft if left unchecked; and Alert 3 was a crash. He clarified that it was “basically how you’re dispatched” (like structure fire or vegetation fire). Yellow or red was an element of that - once they know the potential for casualties and the need for resources, then they classify yellow or red. He said normal procedure was for the 101 or 303 boxes to come first. The IC later determined a yellow or red alert. 101 or 303 can be called while the IC was responding or it can be done automatically. He did not know if Captain Robinson classified it as a yellow or red alert without reviewing the radio recordings.

The communication frequencies used at the airport were different than those used at the city. The arriving vehicles know the procedure was to switch to a designated frequency for the airport which he believed was C9 at the time of the event. He could not confirm if city and airport firefighters were talking on the same frequency, but would have to check on that. Once they arrived Chief Siragusa took over incident command and that was the standard operating procedure at the time of the event. At the point that Chief Carnes or Chief Dea arrived they could have taken command; otherwise, the arriving assistant chief took command of the incident per policy. He stated that based on reviewing the outcome of the accident Chief Carnes was anticipating making changes to the command structure as to how they handle an event like this in the future. That was why he was bringing in the formal incident management training.

Chief Carnes was asked to describe how the police and medical response fits into the incident command structure. They have a minimum of 2 paramedic units staffed every day. They establish casualty collection points, initiate triage, and set up treatment areas. The ambulance provider (AMR ambulance) assumed the transport officer role. The police department fell under unified incident command and had an officer in the command post. Fire would have a lead of the incident command up to the point that hazards had been mitigated, all victims rescued, the fire had been extinguished, patients transported, and the incident needed to be transitioned to an investigation status. That was the point they would transition to law enforcement taking the lead. He was not aware of any difficulties that happened in the incident command during the accident.

He was asked about the policies and procedures in place to ensure the arriving incident commander gets an in-brief from the departing incident commander. He described the operations manual section that had a template for transfer of command from the initial IC to the new IC. It included things like situation status, resource status, initial action plan, current strategy, concerns, etc. It was a verbal brief ideally done face-to-face, but could be done via radio in certain situations.

Chief Carnes stated that he had reviewed audio communications from airport after the event, had looked at multiple sources of video, and reviewed the majority of statements of personnel who responded on scene. He was asked questions about the response to the event based on his review of this information.

He stated that Airport Operations was responsible for setting up the command post and he believed that it was done in a timely manner. The two paramedics were responsible for establishing the casualty collection point. The emergency operations plan for the airport had diagrams on how to set up the ideal scene but it did not take into account the flow of victims from the aircraft. In this accident the majority of victims had either gotten or were getting off the airplane and triage was set up where they were. There are two predetermined staging areas for mutual aid: one adjacent to Fire Station 2 and the other adjacent to Fire Station 3. Generally it was the responsibility of initial IC to determine which would be used. If he did not, the default staging area was near Fire Station 2. (Fire Station 2 was directly in front of Super Bay.) The boat operator initially assumed the role of staging area manager based on the procedures in effect at the time of the accident. (Chief Carnes was in the process of drafting policy that the first arriving mutual aid officer will assume the role of staging area manager.) Airfield safety officers were to escort mutual aid companies from the gate through the staging area and across the field once they were assigned to the incident. Mutual aid arrivals were to be issued radios at the checkpoint – in this case the North Field gate. In this accident he could not definitively state whether they were issued or not, but felt they should have been. The North Field Checkpoint gate was manned by police service aids – uniformed but non-sworn personnel. He was not aware of any delays of people getting through that gate. When vehicles arrive at staging, the staging officer was to notify the IC to find out if they should be taken to the scene. In his review of the audio he learned that some companies bypassed that policy. That has been brought up in after action meetings. He thought it was a training issue.

Chief Carnes was asked if there was a master list of units and personnel who responded to the accident. He stated that such a list would come from 3 documents: one from San Mateo County, one from the city of San Francisco, and one from the airport. Based on his experience and his assessment of the information he had reviewed, the mutual aid response was adequate, but he was not down on the airfield as it was happening. There were multiple alarms from San Mateo County and the City of San Francisco as well as all his ARFF personnel. When asked about airport staffing he said he believed that any fire chief would want more personnel but he thought he was fortunate to have what they have at SFO, based on his knowledge of other similarly-indexed airports. Their normal duty shift was 23 people, including the Rescue 91 and Rescue 93 personnel.

When asked about a formal, written mutual aid agreement between the airport and San Mateo County, he stated that he believed one did exist and he would attempt to locate it. There would not be an agreement between the airport and the city as both are part of SFFD. He said that there was a confederation of multiple municipalities within San Mateo County.

Chief Carnes was asked about Rescue 10 stopping to cross a runway for a period of time after the airport was reported to be closed. He stated that the issue had not come up in after action debriefs specifically. They did regular training at the airport on the proper procedure to cross runways and procedures to communicate with the tower and monthly Redcap drills. His personnel were ingrained with proper procedure to cross active runways. His assessment was that the FAA audio from the tower showed they closed runways almost instantly, and that information was put out on the airport ground frequency. ARFF monitored that in the vehicles;

however, Chief Carnes said that it was likely put out before the majority of his company responded. Therefore the majority of his personnel were not aware that the runways had been shut down and they defaulted to the ingrained procedures. He was pleased that, under stress, his crews were concerned about the safety of other airplanes possibly landing or taking off and were trying to respond properly.

When asked about the Snuzzle device, he stated that the airport fire division did not have a specific policy on the best time to use the piercing nozzle on the HRET. He said one of the concerns of the ARFF operations personnel on scene in this accident was that, for a considerable amount of time, they had both personnel and victims inside the aircraft. A policy for HRET/piercing nozzle use was being developed at the time of the interview. Chief Carnes was part of the E-NET (an affiliation of all the Index E ARFF chiefs) and he was canvassing all of them about this topic so that he was not developing the policy in a vacuum. He was also using the FAA's advisory circulars and other guidance in developing the policy. Because he had only been on the job for 5 days at the time of the accident he did not know what the training on the HRET had been before the accident.

All of the ARFF vehicles had two firefighters assigned to them on the day of the accident. The minimum staffing was one person but he believed that they had a full shift which gave them two per vehicle. He stated that all ARFF personnel had been through the 40-hour ARFF training course at DFW after the accident. There was no policy at the time before the accident about going through this 40-hour course and not everyone had attended a 40-hour course prior to the event. At the time of the accident new firefighters arriving at SFO would be placed right into the recurrent training program and given a live burn at the first opportunity.

There was no formal policy on maneuvering or positioning trucks at the time of the accident. Chief Carnes stated that one of the four ARFF vehicles had a lieutenant on it. Currently it was the Oshkosh 3000 truck that had a total of 3 people assigned. During an Alert 3 or a fire on an airplane, that lieutenant would become the fire attack supervisor and would be responsible for supervising ARFF placement, application of agent, etc. At the time of the accident there was not anyone serving in that functional role. Since the accident, Chief Carnes had begun the process of formalizing their incident management. Fire attack that day was Chief Johnson but it was a different application of the term than the airport had adopted. The new policy was something he was doing at SFO related to command and control and gave him one lieutenant in charge of three companies and his initial IC would have control of fire, rescue, and medical groups. He had discussed the policy with other airport fire chiefs. He stated that there are many different ways to do it from airport to airport but he had not received any negative feedback on it.

Chief Carnes was asked about how they managed to continue to respond to normal airport calls for assistance when involved in a mass casualty incident. He replied that there was no clear procedure or policy about that at the time of the accident. He was working on standardizing and formalizing about how they would use mutual aid resources in the future as well as formalizing and standardizing the recall of off duty personnel. The goal was to prevent or limit pulling away airport resources that were already committed to an incident. In this accident, they had started a recall process and a lot of their personnel came in on their own after being made aware of the accident by social media and news. By the time they were midway into the response he almost

had another complete duty shift. Since the accident a recall was handled by the airport communications center as part of the mass notification system. The recalled personnel reported to their stations and staffed reserve apparatus, were dispatched to the scene, or told to return to stations to cover their stations.

Chief Carnes was asked if he knew the origin of the confusion about 60 passengers that were allegedly unaccounted for. He stated that the best he had been able to figure out it was a matter of patient count and recounts as they were moving the walking wounded (classified green patients) to a secondary triage area. It was difficult to get an accurate count repeatedly because they were moving. Once the adrenaline wore off a lot of passengers realized they were injured. Some saw family and friends transported and did not want to be separated, so they sought additional treatment and were then reclassified. They were not missing patients – it was a patient count and information transfer issue.

Chief Carnes was asked about medical personnel and mutual aid responding to the area behind aircraft and along the debris field. He said that they were in a complete policy and procedure development process that would be comprehensive both operationally and administratively. Operationally, one of the things they needed to address was that, while initiating ICS, they needed to do a total reconnaissance of the total incident scene – to get a picture of both total casualties and also where the patient groups were located.

When asked the difference between an EMT and paramedic he said a firefighter/EMT was a basic life support provider. The difference between EMTs and a firefighter/paramedic was that a FF/paramedic is an advanced life support provider. There was a significant difference in training and accreditation. Rescue 91 and 93 would each normally be staffed with one paramedic and one EMT. Additionally, one engine company had a paramedic on as well. The decision of what these people need to do first on scene defaults to their training and experience. The key consideration for triage was to do the most good for the most people first and, within the “golden hour,” get victims to an appropriate facility as rapidly as possible. They performed triage to establish who was a priority and what category people fell into. The triage system was very rapid and started as a patient is found. An assessment of a patient usually takes 1 minute or less and then, using flagging tape, the patient’s category (green, yellow, red, black, etc.) was assigned. The responder then moved to the next victim. They direct walking wounded to the casualty collection point, and then triage victims on the ground who were not capable of moving. The assessment acronym was “RPM” – respiration, perfusion, and mental status. They normally put surveyor flagging tape on an arm or leg and moved to the next victim. The dead or dying were the last to be addressed in the triage process. The triage philosophy was that if they inappropriately apply resources to those victims who were dead or dying, they would lose people who could have been saved.

Regarding the victim in front of the left wing, all of his personnel he spoke with felt she was obviously deceased. He said that the personnel who saw her described her using terms like - unconscious, unresponsive, apneic (not breathing), lifeless, etc. In their professional opinions as firefighters, EMTs, and paramedics, she appeared to them to be dead. There were known victims in the airplane and they were in rescue mode and needing to get those people off as quickly as possible. Throughout their training firefighters were trained to try to maintain anything that was

a potential crime scene and to disturb things as little as possible, including obviously deceased victims. He thought that came into play in this accident as to why his personnel did not move the deceased victim. Neither at the time of the accident nor at the time of the interview was there a clear cut policy on the movement of deceased victims in a situation like this. In talking with ARFF chiefs about the topic, Chief Carnes said it seemed like no one had a pre-established policy. The most input he had gotten was from the people at DFW.

The triage kit was a fanny pack that had the flagging tape in it. It was on the 2 paramedic vehicles on the day of the accident because the primary responsibility for triage fell on those units. The paramedic on the engine company was in firefighter mode/rescue mode and did not have equipment to mark victims. He was changing this and planned to put the triage equipment on the engine as well.

He believed one patient was transported by the USCG helicopter. When asked he stated that there was a medical clinic at the airport. One doctor was on duty during certain hours and at least one nurse. He did not know if they had a role in the accident response.

There had been a series of debriefs and airfield safety/operations had been a major stakeholder (along with his division) in the process. They had not discussed any issues about the escort policy delaying any mutual aid response. Chief Carnes was not aware of any design/redesign issue with the North Field gate that may have impeded mutual aid entry. He said that the topic of needing more mass casualty medical equipment had come up in after-action reviews. There were two medical buses that were maintained by airport operations. They were strongly looking at developing or acquiring a mass casualty apparatus along the lines of what DFW operated. They considered a trailer but wanted something bigger. DFW's vehicle was actually about the size of an engine company.

Regarding water resupply, he stated that they were planning multi-company drills of water shuttle operations and having discussions on better ways to do that. They were examining options including large diameter hoses and/or portable hydrant system and how that would work. They do not have a foam trailer but the issue of foam resupply had not come up yet.

Chief Carnes was asked if, in his opinion, there was sufficient guidance to develop their new policy on HRET/Snozzle use. He said he would like more assistance. They had looked at the FAA advisory circulars but would like clarity on suggested tactics and strategies - especially timing guidance would be helpful. Chief Carnes used the advisory circulars and he was in the process of discussing tactics and policy with DFW's training staff. The new SFO training program will mirror DFW's. They have formed a strategic alliance with the tactics training center in DFW. He had not reviewed the FAA tech center report yet.

They had PAST training devices at Fire Stations 2 and 3 that they train with regularly. They also received a HRET computer simulation system when the Strikers were acquired in 2008-2009. They had been working with the company who provided it and their IT department but had never been able to get it to work. The IT problems for the simulator predated the accident. After the accident his training staff was put back on it and had been aggressively trying to get it up and

running. They were still continuing to pursue it even though the IT department had not been able to get it to work.

He did not recall the approximate date of the last full-scale drill prior to the accident off the top of his head and said it was possible that mutual aid firefighters responding to an accident at the airport would not have previously been on the airport.

Interview: Mr. Gaetano Caltagirone, Lieutenant, San Francisco Police Department (Airport Bureau)
Date/Time: 13 July 2013, 1216-1309
Location: San Francisco Police Airport Substation, International Terminal, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB), Randy Moseng (FAA), Terry Smerdel, (SFFD)

Lt. Caltagirone had 19 years of service at the SFPD, the last 2 years at SFO. Lt. Caltagirone was in his office on the fifth floor in the International Terminal when he heard the call by Officer Brown for a Code 33. He heard over the radio "plane crash 777" and looked out the window and saw the crash. He responded to his police vehicle from Courtyard 4. Sgt. Pera drove him to the West Field gate for entry. He notified headquarters that he was responding and would be the Incident Command (IC) for the police department. Lt. Caltagirone used his cell phone to call Captain Pardini and notify him there was an airplane crash. He stated that he had no further information and that he would update him when information was available. Capt. Pardini informed him that he would respond as soon as possible. Lt. Caltagirone was at the West Field gate and heard people asking for airfield safety officers for escorts. He radioed for an airfield safety officer at the gate but got "dead air."

He asked headquarters if airplanes had stopped landing and headquarters confirmed that there were no more landings or departures. He told headquarters he would not be using an escort and proceeded with caution to the incident. Officers Valenzuela and Baca were running on foot to the scene. They had exited the gate area into the airport operations area. He picked them up, proceeded to the site, and could hear his officers on the radio taking care of passengers.

He pulled up to the scene and stayed on the asphalt forward of the left nose of the airplane. He noticed grayish-black smoke and fire. The two front doors on the left side were open with the slide/rafts deployed. He saw passengers evacuating the airplane. Some were gathering near the tail on the runway side. Passengers were huddled in little groups toward the front of the nose as well.

The fire department was on scene spraying water and foam to extinguish the fire. Lt. Caltagirone believed the 3L and 4L doors were missing. He ran around the left side of the wing and saw Officer Cunningham. Firefighters were pulling passengers out of door 4R. He saw a female fire lieutenant and Officer Cunningham go inside to assist passengers. He did not want Cunningham to be by himself (he was the only officer going inside with the firefighters) so he followed him in. They stumbled over debris inside the airplane. There was grayish-black smoke in the cabin. The seats were "compressed and disheveled" and some overhead bins were broken down. He saw a man stuck in a seat. The man was turning back looking at him and waving his hand. Officer Cunningham removed a portion of the seats and the paneling to make a path through the airplane's tail. Lt. Caltagirone handed parts to officer Valenzuela outside.

The interior fire seemed to be inside the upper part of the cabin area, coming from inside out. He saw flames flare up and then firefighters applied foam. Lt. Caltagirone knew it was time to leave

the airplane. With the assistance of fire department they were able to get the male passenger out who was complaining of back pain. He notified headquarters and requested mutual aid ambulances as soon as possible. He also advised headquarters to notify all local hospitals including Stanford Peninsula and San Francisco General that the airplane had crashed with multiple traumatic injuries. He did not know if SFFD had already notified the hospitals but figured it could not hurt to do so again. The man on the ground was in pain. He wanted a backboard to move him however none were in the vicinity. The fire flared up and they were worried the airplane would explode or the grass would catch on fire. It seemed it was too dangerous to leave the male passenger. They were ready to move the passenger by hand when a backboard arrived from the fire department. They put him on the backboard and moved him to the triage area.

He was not sure if there were still passengers inside so he conducted another search. He looked around at the other officers and they were all tending to passengers. There was no radio communication with SFFD, but he was working with them side-by-side so they could communicate to evacuate and render aid to passengers. Officer Cunningham continued to assist passengers and Lt. Caltagirone stepped away. Outside there was a woman behind the tail of the airplane, approximately 20 feet away. She was laying on her right side, bleeding from the mouth and nose. An airfield safety officer was sitting next to her. They tried to put her on her back; however, it was too painful so he immobilized her. There were also two children present (a boy and a girl who were brother and sister) but the woman near the children was not their mother. The young girl had one shoe and one black sock the brother had no socks or shoes. The girl's ankle and/or leg was injured. With the fire growing he put the girl on his back. The boy's feet were hurting, so he carried the girl on his back and the boy on his right side. He walked across the field with them to the trauma area that was located on taxiway November at the nose of the airplane.

He had walked about 20 yards when someone screamed "pick up!" An airfield safety officer had brought a pickup truck and was gathering passengers. He brought the boy and girl to pavement and set the boy down and placed the girl in the cab of the truck. He asked for six additional backboards over the radio. The fire department and police were putting passengers on backboards and loading them into the airfield safety officer's truck bed. Small groups of people were huddled up near the back of the airplane. He thought they must be either injured or not sure where to go. He and Chief Siragusa advised those that could walk to go to the trauma area. Some passengers stated they could not make it so some passengers aided each other to get to the area.

At some point he asked if all communication checklists had been completed and was informed they had been. The SFPD captain called him on the phone and said he was at the Emergency Operations Center in Terminal 2. The SFPD captain was in communication with SFFD to have a unified command. They were able to gather everyone to trauma area. He was told that 60 people were still missing. At that point he and Officer Cunningham were still in the area outside the back of the airplane. Officer Cunningham decided to go back in and Lt. Caltagirone followed. Officer Cunningham confirmed that no occupants remained on board. They looked up and could see the smoke and fire getting worse. They heard crackling and it could have been the windows

shattering. He told Cunningham they needed to get out and they did. He went further behind the airplane to assist other officers.

Officer Keane was standing by a deceased passenger in front of the left wing who was covered. He asked if the coroner had been contacted and was told that they were en route to the scene. He thought he needed more police on the scene so he requested a tactical unit from downtown and any available officers to respond. He received notification that officers were on the way. As the scene was slowly rendered safe, police officers met at the airport command post where SFPD and SFFD had taken position. During the incident he had requested one of his officers to go to Asiana Airlines to get the manifest. They received two copies: one for the SFPD and one for the SFFD.

Passengers who were tagged green during triage were brought to the Gate 91 area. He sent Officer Joseph to document each individual including name, date of birth, and injury. As the incident progressed he instructed officers to create a crime scene and tape off the area from north of runway (in front of the nose) out to the water. He instructed officers to conduct a grid search for any passengers and that the scene was now a crime scene so they were not to move anything. Customs helped in the search and numerous passes were made with no passengers found.

Later they were asked to walk the grid again to look for the flight recorders. He asked if the flight recorders had a ping system and was told that was unknown. The officers got in line again and walked the grid. By this time all of the injured passengers were off the site. He had requested buses to bring the passengers to the Super Bay to triage passengers under shelter, but this did not happen. He had made this request at the same time he was requesting additional ambulances. He had also requested cones to mark any type of significant evidence.

Communication with officers was minimal and it seemed to be a “finely tuned machine.” He stated that it would have been nice to have radio with fire, but the face-to-face communication in this event was good. Lt. Caltagirone gathered officers from Daly City, Colma, Broadmoor, San Bruno, Millbrae, South City, San Mateo and all firefighters on-site. He expressed to them they all wear blue uniforms but they are human and saw a traumatic incident and that it was important to talk about it. He advised them that he was available to be contacted 24-7 and also that behavioral science unit was available to talk to.

He did not see the deceased victim on the left side of the airplane until later in the incident. He was advised about the victim just before the grid search and did not recall who advised him. He asked headquarters to secure any video and was told people at the EOC were already viewing it. It felt like the ambulances took a while to arrive, but he knew that time usually seemed longer in situations like this. He believed everyone worked well together and stated he could not ask for better effort between police department and fire department.

When asked if he had any recommendations based on this experience he recalled that there used to be a building 1000 that had backboards. He was not sure that was still the case but he felt it would have been beneficial. ASO's were taking long routes to get the ambulances off of the airport and felt that they could have opened a closer gate to get them out faster. He believed that if no airplanes were flying the most important thing was to expedite getting the people out.

The setup of the Reflection Room was disorganized. Families awaiting passengers were taken there and then U.S. Customs brought the passengers there prior to screening. When screening needed to be completed, passengers had to be removed from their families in order to complete it. There was almost a riot when the passengers had to be separated from their families. He felt it would be helpful for everyone to be educated in first aid so they can better assist the first responders. He recalled that an officer commandeered a tug to get to the site, and believed that tugs or other vehicles should be allowed to be used in an emergency like this. He stated that people cannot train for something like this and he was very proud of the San Francisco police and fire departments.

Interview: Mr. James Cunningham, Police Officer, San Francisco Police Department (Airport Bureau)
Date/Time: 13 July 2013, 0830-0945
Location: San Francisco Police Airport Substation, International Terminal, San Francisco International Airport
Representative: Lt. Gaetano Caltagirone, San Francisco Police Department (Airport Bureau)
Present: Courtney Liedler (NTSB), Terry Smerdel (SFFD), Randy Moseng (FAA)

Officer Cunningham had 24 years of service with the SFPD at SFO. He was inside Signature Flight Support on the North Access Road when he was notified by Officer Jeff Brown of a Code 33. He said a 777 went down on the runway. Officer Cunningham went to the front of the building looked down the airfield and saw smoke and a cloud of dust. He saw an ambulance from UCSF Hospital at Signature that was there to pick up a child. He stopped and told them to follow him that he needed their help. He entered at the security gate by Signature and had the ambulance follow him to the site. He drove down the cart path to the site and called dispatch to close the runway because he was worried about getting hit. He had to slow his response because the ambulance was following. He drove down the cart path towards Super Bay and was waiting for dispatch to shut down the runway. He followed a SFFD vehicle and had the ambulance follow him. As he approached the crash site he saw smoke and he parked by the fire command vehicle on taxiway F. The ambulance parked by him.

Upon arrival he saw that door 4L was missing and that 1L and 2L slide/rafts were deployed. He did not remember whether door 3L was open or closed. People were evacuating the airplane - some were running, some were carrying bags, some were using cell phones, and some others were lying on the ground. SFFD was already on scene. He told the ambulance to stay there and that he would bring victims to them. There was fire and smoke on the other side of the airplane and fire vehicles were there. He recalled that two firefighters went up the 2L slide/raft.

He saw crew members in the doorways helping people down the slide/rafts. Officers Lee, Molver, and Brown arrived on scene. Officer Molver went to help people while Officers Cunningham and Lee went to the airplane to help people at the bottom of the 1L slide/raft. Female flight attendants were helping people down the slide/rafts and on the ground. The flight attendants asked for a knife. Officer Lee opened his and handed it to a male crewmember who was halfway down the slide/raft. Officer Cunningham threw his closed knife up to the other crewmember who went back inside with it. Officer Cunningham told the flight crew to evacuate the airplane.

Officers Lee and Cunningham looked at the wing and fuselage and saw that fuel was gushing out onto the dry grass and dirt. He compared it to water coming out of a fire hose. They asked if everyone was off the airplane. A flight attendant said yes and then came down 1L slide/raft. Everyone ran to a vehicle near triage and he told others to get back by the police cars. He moved everyone away onto the asphalt. Passengers were milling around the taxiway not sure where to go. Passengers were going back to the slide/rafts to get items off the airplane. He looked at the tail section and people were still there so he ran to the tail to help move people away. Some were down on the ground and other people were scattered. Passengers around the back of the

airplane were sitting and moaning and could not move. The buses had not yet arrived. There was one ambulance from UCSF and some firefighter/medics, and fire trucks on scene.

Door 4L was open with debris blocking the doorway. There was luggage and bins all over inside the airplane but he saw movement. They started pulling things out of the airplane to get inside. He saw three firefighters - Lt. Emmons, Lt. Monteverdi, and another - coming down the aisle inside the plane. Lt. Caltagirone came in behind him started clearing a path. Seats were askew and oxygen masks were hanging down. No one he saw had any open wounds. The firefighters asked for backboards. He ran over to the ambulances, got backboards and went back to the airplane. The conditions were getting worse and he could not see through the fuselage because of the smoke. People were stuck on the right side of the airplane and could not move. He and Lt. Caltagirone were assisting two or three people. They were hard to get out because of the debris. The last two people on the airplane were having a difficult time breathing. There was thick black smoke swirling down on them and he could smell jet fuel. Two passengers were placed on backboards and he helped lift another. They could not get footing because of the debris on the floor. They were trying hard to get the last person out and not choke on the smoke. They finally got out of the airplane. Lt. Caltagirone found two children - a boy and a girl - right outside the airplane. He heard a popping noise. The fire was getting worse and the windows were changing color.

Airfield operations personnel came over and helped load people in the back of a truck. They put the female passenger in the passenger seat and the children inside the truck with an elderly man and a flight attendant. They also put people in the bed of the truck. They drove over to the asphalt by triage. He went back to the airplane and went back inside to take a quick look. There were approximately four people on the right side of the airplane. The fire was really getting going at this time. The heaviest fire was in the middle of the wing area.

He later heard that 50 to 60 people were missing. Lt. Caltagirone asked if there were people still inside the airplane so he went back in and looked. There was no one inside. Conditions were bad and he heard crackling inside so he ran off the airplane. He then helped people who were wounded. They were overwhelmed and there were not enough backboards.

He was coughing a lot. Lt. Caltagirone walked him back to Medic 86 who put him on oxygen for about 15 minutes. He then went back to the tail section to look for more victims. The front of the airplane was higher off the ground and back of the plane was resting on the ground so they were able to walk in. Officer Lee was also looking for more victims and organized a search for people from the airplane to the water. They searched twice to be certain they did not miss anyone. No one was found. There were a lot of rocks from the wall on the runway with debris. They later did two skirmish line searches to look for the flight recorders. He believed they found one tire by Super Bay and put cones around it.

Everyone seemed to be working well together. SFFD did what they were supposed to do. There was no shelter for anyone from the sun. The most seriously injured people were put into ambulances and taken to hospitals first. Then the green tagged people were put on the buses. The firefighters organized and counted the people getting on the bus.

When asked if he had any recommendations based on his experience he stated that there should be a better way to get people to triage. Because people were scattered it made it difficult for SFFD to get around. He believed that the airplane crewmembers should have objects (like seatbelt cutters) to cut things if necessary. First responders did not initially realize that people were still trapped in the back of airplane. Someone said the airplane was clear. There were not enough backboards and neck braces and a better method for moving them to a safe zone was needed. Shelter from the sun was also needed for victims and responders.

Interview: Mr. Derrick Lee, Police Officer, San Francisco Police Department (Airport Bureau)
Date/Time: 13 July 2013, 0952-1050
Location: San Francisco Police Airport Substation, International Terminal, San Francisco International Airport
Representative: Lt. Gaetano Caltagirone, San Francisco Police Department (Airport Bureau)
Present: Courtney Liedler (NTSB), Randy Moseng (FAA), Terry Smerdel (SFFD)

Officer Lee had 15 years of service with SFPD, the last 3 at SFO. He stated he was on the unsecured side of Terminal 3 on his Segway at the time of the accident. He was notified via a call from Officer Brown. He went to Courtyard 4, got a police vehicle, and went to the North Field Checkpoint. He saw smoke coming up by the water on the airport.

He drove his vehicle to the area of the smoke. He saw Officers Cunningham and Brown arrive on-scene. There was one ambulance following Officer Cunningham. There were two fire vehicles on-scene when he arrived. One was in front by the wing shooting foam. He and Officer Cunningham were on the left side of the airplane where the slide/rafts were deployed from doors 1L and 2L. Most of the people were coming out of 2L. A flight attendant at the bottom of the slide/raft said she needed a knife and Officer Lee opened his knife and gave it to the flight attendant. Officer Cunningham gave his knife to another flight attendant. There were three flight attendants at the bottom of the slide/raft and one at the top. Another flight attendant was on the ground with back pain. He stated that one ran up the slide/raft with a knife and came back down again and gave the knife back and then ran back up.

He noticed a large amount of fuel coming out onto the ground and stated "it was spewing out like a faucet." He notified "fire" that fuel was leaking and told them where it was. Flight attendants were still assisting passengers and he told the flight attendants to get off the airplane. He thought it was going to explode. He said 3 to 4 flight attendants came down the slide/raft and they joined the passengers on the left side of the plane in a group. It took a while to convince them to come down the slide.

He walked with an injured flight attendant halfway to the staging area and gave the flight attendant to her counterpart to take her the rest of the way to triage. He lost sight of Officer Cunningham at that point. He noticed a lot of people with facial injuries. Many people were concerned about the students trapped on the airplane.

He ran to the back of the airplane and noticed passengers walking about 100 yards behind the tail of the airplane. He and the passengers noticed a flight attendant on the ground. The people outside the tail of the airplane had injured legs, arms, and heads. One passenger was with a flight attendant he was giving her comfort. Another flight attendant's scalp was missing and she had deep abrasions on the legs and arms. She was alive, with her eyes open, and communicating.

Passengers with the flight attendant were yelling at Officer Lee using profanities. He attended to the passengers' needs and then left to look for more victims ejected from the airplane. There

were more injured passengers behind the airplane, all spread out. He could hear passengers yelling for help. Other passengers were tending to victims on the ground. He radioed for additional paramedics for the serious injuries and stated that there were major head injuries. He had no communication problems with dispatch.

He went to the back again and saw several passengers attending to about five people that were apparently ejected from the plane. There were three flight attendants and 2 passengers, all alive. Two passengers and one flight attendant were lying face down. He approached the passengers who were face down and saw that they were breathing. They responded that they could hear him and he told them that the medics were on the way. He told one of the passengers to talk to and comfort them and then he went to look for victims. He got 15 to 20 feet away from the tail of the airplane and the ambulances were coming his way from Super Bay so he waved them over and pointed them to where the passengers were. He continued to search for injured passengers behind the tail of the airplane, on the runway, and at the water's edge with Sgt. O'Mahony. They did not see any additional injured passengers.

Fire engines arrived shortly after the first ambulance departed. There were over 10 firefighters on the tarmac. He advised them to search from side to side for more victims on the ground. Additionally, Officers Keane, Joseph, Glenn, Brown, Molver, O'Mahony, and Poon were there. They all conducted another search. They searched the grass area and the tarmac (east of the crash) and the north side of runway and the runway end. There were five victims - four (all critically injured) were transported by ambulance and one was fatally injured.

Paramedics were tending to two victims in the back of the ambulance. He asked why they were not going to hospital yet. The two paramedics stated they needed a driver because one of them was a driver and they needed both in the back to work on the patients with serious injuries. By this time SFFD had arrived on-scene with more than one apparatus. He asked a firefighter to drive the ambulance and a firefighter told them he could not drive the ambulance because of something about jurisdiction. He was "in awe" of why the firefighter could not drive and this discussion went on for about 3-4 minutes.

He notified his lieutenant of what was happening and flagged down the fire chief who was in a white vehicle. Officer Lee was going to convince the chief to have one of his firefighters drive the ambulance to the hospital. He then saw the chief have a discussion with one of his firefighters. The chief told one of his firefighters to drive the ambulance to the hospital and he complied. Officer Lee then assisted moving passengers over to the command vehicle (in front of the plane) via an airport employee's vehicle.

When asked if he had any recommendations based on this experience he offered that he thought everyone did a great job but he was disturbed by the argument between the firefighters and paramedics for transport. They did the best they could with what they had.

Interview: Mr. Dennis O'Mahony, Sergeant, San Francisco Police Department (Airport Bureau)
Date/Time: 14 July 2013, 1458-1559
Location: San Francisco Police Airport Substation, International Terminal, San Francisco International Airport
Representative: Lt. Gaetano Caltagirone, San Francisco Police Department (Airport Bureau)
Present: Courtney Liedler (NTSB), Terry Smerdel (SFFD)

Sergeant O'Mahony had 18 years of service with the SFPD, the last 7-8 months at SFO. When the call about the accident came in he was at the lower Terminal 1 substation (road side). He was assigned to the traffic side of the airport police. He heard a call "Code 33" which means "clear the air – emergency" from Officer Brown. Officer Brown stated that an airplane crashed on runway and it was a large airplane.

Sergeant O'Mahony responded in a marked police vehicle from the substation. He took the North Access Road to Gate 82 at the North Field checkpoint and entered the Airfield Operations Area (AOA). He saw an ambulance and fire vehicle enter behind him. Two additional police officers got into a vehicle and followed him. He could see the freeway and an ambulance was en route in emergency mode behind him. When they got to Gate 82 it was open and manned by another police officer. His vehicle, the ambulance, and a second police car proceeded through the gate and an ASO was there to escort them to Super Bay. The ASO then left and the ambulance continued to follow him.

He saw a fire vehicle pulling out from the crash house and he followed it with the other officers behind him. He heard dispatch advise that the runways were closed. He pulled to the side and continued ahead of the fire truck straight to the crash site. He arrived at the crash site by Taxiways F and N by the command vehicle. He parked and went over to the airplane. He did not remember seeing smoke or fire at that time but recalled two slide/rafts deployed. Firefighters were already on-scene when he arrived. He made his way toward the airplane and saw two flight attendants come off the airplane. They were crying and walking away from the airplane.

A large group of about 40 to 50 people were near where the vehicles were parked on the grass and pavement area. Everyone he saw was ambulatory. He guided people coming off the slide/rafts in that direction. He went to the back of the airplane and looked back down the runway. There was a large group of people, about 100, next to runway 28. They were behind the airplane and about 50 yards away. He went toward the group and saw a lot of people standing around in shock, in disbelief, and confused. He saw other officers and firefighters arriving on-scene. One male passenger was lying in the grass area just in front of the larger group of people. The man was conscious but could not move and he did not want to move him. He told the man that help was coming and had people stay with him. There were several fire trucks on-scene by that time.

Officer O'Mahony saw lots of people with cuts, bleeding, and some visible head injuries. They were all moving and ambulatory. Some people were starting to sit down and there were some small groups by the taxiway F. He said he looked to the right and saw the 747 on the taxiway

and lots of people in small groups standing there. He told two other officers to move those people from the taxiway over to their vehicle with a command post and direct the passengers behind the plane over to there.

Officers Lee and Robertson were in the area behind the airplane with him. They started to triage the passengers who were hurt badly and who needed immediate medical attention within the larger group. Officer Lee continued to look for people further back. They got the walking wounded to move toward the incident command area. He continued down the runway toward the water. Officer Lee was already on the runway. Officer O'Mahony saw more serious injuries were toward the back of the airplane.

He called for ambulances to respond behind the plane on runway 28 because someone was lying on the left side of the runway. There were a couple of people standing around the one person on the ground. Firefighters went to help the person. He saw two fire trucks and three ambulances being escorted by an ASO down the east side of the 28 runways. Officer Lee found one passenger in the runway area and when fire personnel and medics arrived he pointed them to the injured.

The tail of the airplane and debris was near the seawall and he walked there to look for victims. He told Officers Lee and Robertson to continue to look through debris field. They walked the field and found no injured people.

Officer Keane was on the right side of the runway and notified Officer O'Mahony that there was a fatality. A paramedic had already pronounced a female victim dead. Another officer informed him they found a piece of scalp just off of the runway on the right side. He went over and saw a big piece of debris, maybe a jumpseat. He stated there was blood on the jump seat and blood on the ground and a human scalp with hair and blood.

He stated he did a coordinated search for victims in the debris field to the water line at the seawall and all the grass areas around the runway. He checked both sides of the runway looking for victims or injured people. There were several fire trucks in the aft grassy areas on each side of the runway. There were several firefighters and a passenger in the aft area near the seawall. He saw one piece of debris in the water about 25 feet out - everything else was on the runway. There was a boat in the water but it could not get very close due to low tide. Two people with Asiana Airlines were also there trying to help. He told them to go over to the incident command post. Officer Keane was waiting with the body in front of the left wing for the San Mateo County Coroner.

Officer O'Mahony said he controlled the scene to ensure it was secure. He determined it was a crime scene and cordoned off the area in front of the airplane, across 28 left and right, over to the water, and down taxiway F to the water. Anyone not needing to be there was escorted off. He stayed in contact with Lt. Caltagirone by radio, phone, and in-person.

Later they expanded the search area and walked the entire site looking for victims. This was done two or three times, up and down. They did it again later to look for the flight recorders.

SFPD tactical unit and U.S. Customs were both there to assist them with helping search the area. The perimeter of the scene was set with cones and crime scene tape.

They went back to the command post area and stood by until relieved, around 1930. He returned to the substation to complete the rest of his watch. He stated that when making a radio request he always received a response. He felt there was good discipline not to step on each other's radio calls. When asked if he had any recommendations based on this experience he offered that it was a unique incident and could have been a lot worse. Everything got under control in about 30-40 minutes. He believed that the San Francisco Fire Department command had a quick response. He stated the SFPD and all other officers did an impressive job. He said the ASOs did an unbelievable job. He thought the 'Redcap' drills were helpful. He suggested putting ambulances in different staging areas - not just one. He believed they would learn and be better prepared from this experience.

Interview: Ms. Angel Poon, Police Officer, San Francisco Police Department (Airport Bureau)
Date/Time: 14 July 2013, 1218-1302
Location: San Francisco Police Airport Substation, International Terminal, San Francisco International Airport
Representative: Lt. Gaetano Caltagirone, San Francisco Police Department (Airport Bureau)
Present: Courtney Liedler (NTSB), Terry Smerdel (SFFD)

Officer Poon had 18 years of service with the SFPD, the last 2 years and 4 months at SFO. She was in the women's locker room and heard on her radio that a 777 had crashed. Then traffic started coming over the radio - Code 33 (which means clear the air), proceed to gate 82.⁹ She jumped on her Segway and went over to Gate 82 where she saw two bicycle officers and another officer. She went down the stairwell of an emergency exit. She thought about bringing her Segway but it was too heavy. She looked left and right for transportation, saw no one and started running. She ran from Gate 82 to Gate 54. She kept calling on the radio for mobile unit to pick her up again at Gate 54 but no one did.

She flagged down a tug at Gate 54. He drove her about 100 yards and stopped. He told her he had to be escorted from there so she ran across the tarmac toward the site. She was picked up by Officer McIntyre and they went to the site by the perimeter road all the way around to the crash site. She said she did not hear that the airport was closed and Officer McIntyre obeyed all of the AOA rules. She stated that the police radios are on channel two and they do not monitor other agencies' frequencies. If they switched channels they can monitor fire, but not air traffic.

When they arrived at taxiway F and N they parked in the grass by other police cars. There were passengers in the grass area and on the pavement between the left side of the airplane taxiway F. The slide/rafts were deployed but no one was using the slide/rafts at the time - everyone was on the ground already. SFFD was on-scene and spraying something on the airplane.

She got out of the vehicle and ran over to the site. She had just gotten out of the car and heard Officer Derrick Lee on the radio say that there was a patient who was bleeding profusely and needed an ambulance. There was no response on the radio. Officer Lee again said "408, code 3, passenger bleeding profusely." (408 meant "ambulance" and code 3 meant "emergency.") Officer Derrick again said on radio "I need more ambulances." She continued running to the site. She made sure everyone on the ground had an able-bodied person with them. She saw a lot of people on the ground and all were being helped by others. She saw a woman on the ground to her right. A passenger walked up next to the injured woman so she kept running. She ran past the airplane and saw debris behind the tail. There were a lot of people on the left side as she went toward the runway. There were less and less people as she went toward the debris. She saw a person lying on the cart path with approximately 6 people standing around him/her. She ran from the cart path across the field to the runway.

⁹ She stated there were miscommunications on the radio. They said Gate 82 but they did not specify if it was a terminal or the access gate by station Fire Station 2.

She found her partner, Officer Lee, on the runway with a woman who was on the ground. Her partner told her she was 802. (802 means death, cause unknown) They went walking through the debris field looking for victims toward the water. They did not find anyone. Officer Derrick told her they were missing 20 to 30 people so they kept walking back and forth. Once they got to the water they walked back up the north edge of the debris field. They did not find anyone. She saw SFFD and U.S. Customs near the water. There were 4 fire trucks on the runway and no ambulances. She walked east towards the water and saw a deceased victim on the runway. On the right side of the victim (on the right side of the runway) she saw a "box" with the seatbelt with blood and hair on it. She then said that the area should be considered a crime scene not to let anyone touch anything. She said she walked to the edge of the water and she saw a passenger from the crash and told him to go over to the triage area.

She heard on the radio that about 20 people were still unaccounted for. Later she heard that four were unaccounted for, and then that only three were unaccounted for. She continued searching. One and a half hours later she went from "rescue mode to preserving the crime scene mode." That meant to her that no more passengers needed to be moved or needed medical attention and that all unnecessary people should be removed from area.

She saw two Asiana Airlines representatives and she told them it was not safe to be there. She asked them how they got there and they said ops escorted them in. Officer Derrick escorted them back to triage with the police car. Lt. Caltagirone told them to search the area systematically again. She told three customs agents to get the apparatus numbers, names of firefighters, and their associated department. She handed this paper over to officer Molver. A United airplane was sitting on the tarmac for hours. She asked U.S. Customs what they could do to move the airplane. Fifteen minutes later a tug and a yellow airport operations vehicle came and pulled the United airplane away.

She walked the field three times. Crime scene tape was put up from the car staging area across the runways to the water. They found pylons to assist in blocking off the scene. More officers arrived and they walked the scene two more times looking for passengers and victims. When asked if she had any recommendations based on this experience she offered that she understood that police have to obey airport safety rules for driving on the airport but wished they could have just driven straight to the crash site. She felt they need a better way to get the officers from the terminals to the crash site. She also said that the Asiana representatives were an example of people just showing up at the crash site that did not need to be there.

Interview: Mr. Stuart Molver, Police Officer, San Francisco Police Department (Airport Division)
Date/Time: 13 July 2013, 1055-1153
Location: San Francisco Police Airport Substation, International Terminal, San Francisco International Airport
Representative: Lt. Gaetano Caltagirone, San Francisco Police Department (Airport Bureau)
Present: Courtney Liedler (NTSB), Randy Moseng (FAA), Terry Smerdel (SFFD)

Police Officer Molver had 19 ½ years of service with the SFPD, all of which was at SFO. Officer Molver was notified of the accident via K9 Officer Brown over a radio call. Officer Molver was in police car 20 near security access Gate 27. The radio was tied up so he entered into the CAD that he was at Gate 27. He responded to the scene via taxiway J. He waited for an escort to get to the crash site and made a request over the radio. He saw Airport Duty Manager Wilson who motioned for him to follow. Officer Molver heard over the radio that all runways were shut down. He continued to follow ADM Wilson to the accident site and parked near the nose of the airplane - approximately 100 feet away. He saw white smoke rising from the top of the airplane and the rear of the cockpit. Rescue 88 was at the nose using extinguishing agent.

He approached from the left of the airplane. Passengers were coming down the slide/rafts, but by this time not many were still exiting. The slide/rafts looked okay. He walked under the left wing (there was no engine) and helped some passengers. He also escorted some passengers away from the airplane to the collection area. He saw fuel or water coming from the wing and smelled fuel. He went to the back and saw Officer Cunningham and firefighters from Rescue 33 bringing passengers out. Rescue 88 was applying foam at the time. There were five passengers inside the back of airplane. One male passenger was ambulatory. They carried four other passengers out of the airplane. There was a green and white handline up to the airplane. One male passenger was brought out without a backboard. He was carried by his shirt on the right side with a firefighter on the left and one at his feet. Officer Cunningham and Firefighter Kirk handed him the passenger and he stayed outside. He carried the passenger halfway to the collection point and another person met them to walk the remainder of the way. Officer Molver told Officer Cunningham "the airplane is still on fire." Officer Cunningham said "I know, get people off." Firefighter Kirk was inside and was wearing an SCBA. The last two survivors came out on backboards, one male and one female. Eventually these passengers were carried to triage.

Officer Molver then went back to the rear of the airplane. Officer Poon was there. He saw a passenger unable to walk on the cart path with other passengers standing around. The non-ambulatory passenger was being treated with first aid just past the PAPI. It was very quiet both inside and outside the airplane. No one was screaming or panicking. Officer Molver came up the cart path and crossed over to the runway near the PAPI. He requested six ambulances to the debris field near Rescue 56. Officers Poon, Lee and Glynn were in the area requesting more medical attention. Officers were assisting with first aid of victims that were found in the debris fields; however, he did not assist with any of the first aid.

He continued to walk the debris field in a southerly direction. Officer Molver saw Officer Brown and a law-enforcement boat with the blue light in the water. Sgt. O'Mahony was on the scene. Officer Molver walked down the approach lighting catwalk approximately 200 yards and made contact with the boat. The boat was San Mateo County Boat 36 responding from Coyote Point. The boat was looking for victims in the water; however, none were found - only debris. The debris was secured and brought to the beach west of the lighting catwalk. Officer Molver left the catwalk and walked back to the sea wall. He walked back down the debris field up runway 28 left. All of the victims on the runway had been moved except for the fatalities. He recalled seeing Officer Keane with the fatally injured victim. The victim had already been declared deceased by SFFD personnel and he was just waiting for the coroner. The coroner identified the victim with a partial receipt from the airline found in the victim's pocket. The victim was given ID number 13 - 13 by the coroner and was located 30 to 40 feet from the lavatory on the runway. The victim appeared to have slid out of the airplane approximately 97 feet to a point of rest. The victim's socks were burned off by friction and the victim traveled in a prone position facedown. San Mateo County Department Deputy Sheriff Matsura measured the body's location from some type of utility cover in the area. There were three lavatories on the runway in a row. One jumpseat was on the runway and had hair next to it, an oxygen tank missing, and a lot of blood on it. He found an oxygen tank near the runway numbers.

Officer Molver and Deputy Sheriff Matsura went to the other side of the airplane and assisted the coroner with the other victim near the left wing approximately 30 feet from the slide. He smelled jet fuel. The body was imbedded in the mud with the imprint of the way the body rested, consistent with it being run over. This victim was given coroner ID number 13 - 15. This victim was not recognizable by photo or passport ID. The victim was still at the scene when he went off duty.

Officer Molver went back to the first victim and completed a crime scene log. He was given the assignment by Lt. Caltagirone who requested all officers report to the incident command post for debrief. Lt. Caltagirone advised all officers to report "off watch." Officer Molver debriefed and reported off watch. He was told if any assistance was needed the Lieutenant was available 24 - 7. Lt. Caltagirone said it was important to talk about the event, whether individually or as group. Officer Molver left the scene at 1938 and then left the station at 2140. Officer Molver said he had a first aid kit with him during the response, but he never opened it.

When asked if he had any recommendations based on this experience he offered that he was proud of the officers on duty - they did a very good job. Very little communication was necessary to perform the role of the first responders. He did not expect the casualties and debris field. He believed that having a couple of ambulance collection points would have been beneficial. Staggering the ambulance vehicles rather than having only one place for medical help would have been beneficial. He discovered additional casualties while on foot with no medic in sight and had no way of calling ambulances. He recommended having a way to call ambulances "as needed." Officer Molver wished there was opportunity to provide shade for the passengers taken to triage because it was a hot day. Many first responders also suffered sunburns. Officer Molver would also have liked to have seen the airport closed more quickly.

Interview: Ms. Antonette Valenzuela, Police Officer, San Francisco Police Department (Airport Division)
Date/Time: 11 July 2013, 1316-1348
Location: San Francisco Police Airport Substation, International Terminal, San Francisco International Airport
Representative: Lt. Ken Wade Lee, San Francisco Police Department
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA), Capt. Terry Smerdel (SFFD)

Officer Valenzuela had 15 years of service with the SFPD, the last 4 days at SFO. She stated that the call came in at 1130 via dispatch. A K9 officer Jeff Brown was on the tarmac and advised a Code 33 - a 777 had gone down. She looked out the window and saw smoke coming from the beginning of the runway. She ran out with Officer Baca to their bicycles and they were advised by dispatch to go to "Gate 82." She found out later that they were directed actually to "A2." They ran down the stairs at Gate 82 and she realized they were very far from the crash site. Seconds later Lt. Caltagirone and Sgt. Pera drove up in an SUV. They stopped and picked up Officers Valenzuela and Baca and they went to the crash site. She recalled hearing on the radio that all runways were shut down.

Upon arriving at the scene, she saw the doors on the left side of the airplane open and people were scattered. Some were standing by the slide/rafts. She could not recall if there were fire trucks on the scene when she got there. She and Lt. Caltagirone went to the aft of the airplane. She saw Officer Cunningham and he was throwing debris out of the back door. She noticed the fire. She started grabbing items from Officer Cunningham. She entered the airplane through door 4L briefly and saw it was "all messed up." She did not want to be an obstruction so she quickly exited.

Three people (two female, one elderly male) were taken out of 4L, they were not crewmembers. They were all immobile and brought out and laid 40-50 yards from the airplane in the field. One female had a head injury with bleeding. She was in and out of consciousness. The other female pointed to her leg, which looked broken. She was also in and out of consciousness. The male was groaning and pointing at his back. Medics asked her to stay with him until they came back with backboards. While she was waiting the airplane started catching on fire and she saw visible flames.

Lt. Caltagirone asked Officer Cunningham "is everyone off the plane?" Officer Cunningham replied, "Yes, I believe I got everyone out." He went back inside to take another look. The fire on top of the fuselage was getting larger and larger. Foam was being put on it but it seemed to be growing. She heard a "burst," and then the backboards arrived. She helped put victims on the backboards and then they put people on ASO Esguerra's truck to get them to triage. She saw people in a lot of pain.

Passengers ran to her from the left side tail area of the airplane and asked for help with a family member in the field. Officer Cunningham grabbed a backboard and they assisted an older woman and other people who needed transport. At some point she lost track of Officer Cunningham but she and Officer Lee continued collecting people with the ASO truck, taking

them to triage. Once they were in the cab of the truck a woman said, "I cannot move." Others assisted in getting the injured out of the truck in the triage area. They made approximately three trips. At the end she transported two flight attendants to the triage area but they did not appear to be injured. Around 1300 there were buses that had arrived to transport people to U.S. Customs. She saw a lot of ambulances and fire trucks. She was asked to go to EOC after that and got there around 1300. She never got to the back of the airplane (near the water) where the tail came off.

When asked if she had any recommendations based on this experience she said it was a difficult situation due to the lack of resources (both personnel and supplies) and she felt there should be more accessible first aid equipment – especially backboards. It was difficult to triage quickly. She recalled it felt like an eternity for the ambulances to arrive. She suggested a "shack" be set up containing water and pop-up tents. It was very hot and they really needed shade. Sunscreen would have been helpful too because the officers got sunburned.

Interview: Mr. Brian Horne, Supervisor, Airfield Safety Department, San Francisco International Airport
Date/Time: 09 July 2013, 1312-1425
Location: Administrative Conference Room, Terminal 2, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB), Randy Moseng (FAA)

Mr. Horne said that he has worked at San Francisco International Airport for 13 years and had been in his current position for four years. He had previously been an Airfield Safety Officer (ASO). He was at the airfield supervisor desk when he heard the Alert 3 call for an airplane crash on runway 28L. He and his staff proceeded out toward the event but before leaving Mr. Horne said he directed an airfield camera that was controllable from his office toward the crash site. He also directed ASO Esguerra to secure a passenger bus and take it to scene. He also sent an email out to SFO staff for immediate recall for an emergency response.

While enroute to the scene he heard his ASO staff call in with assignments and locations. He said that ASO Choy was on-scene at the airplane, ASO Batkowski was on the north side of runway 28L, and ASO Crane was conducting mutual aid escorts. Mr. Horne discussed the letter of agreement that exists between SFO and the control tower which automatically closes the airfield following an Alert 3. He believed that the process worked well during this response.

Mr. Horne drove the mobile command post to scene. The vehicle was already running when Horne arrived as ASO Batkowski had already started it. Upon arrival at the scene he contacted Mr. Shannon Wilson, Airfield Duty Manager, and discussed the best location for the mobile command post. He heard calls from his staff trying to get passengers to move away from the airplane. Mutual aid was arriving on the scene. He was not sure if they were all under escort and he knew that others were at staging. Triage was established in an area south of the command post. He worked to get buses to the scene until he asked for ride from an ASO to return to operations so that he could get his personal operations vehicle.

Escorts were continuing when the call came in for an Asiana representative to be transported from Gate 64 to scene. Mr. Horne conducted that escort of a general manager and line manager. Then it became a “coordinated effort” of escorts from north and south field checkpoints. Mr. Horne stated that he knew that the airfield was closed but that there were airplanes stranded on the airfield. Mr. Horne coordinated with his staff (ASO Batkowski) to assist the tower and airplanes to return them safely to the terminal. There was a continual flow of mutual aid from the staging area and Mr. Horne stayed at the crash site to coordinate. At this time other ASOs arrived and offered assistance. He saw two ASO vehicles (Choy and Esguerra) toward the rear of the airplane transporting passengers to triage in their assigned vehicles. Ambulances arrived at triage and when one was ready to depart he directed an escort for it to leave the field.

About 2 hours into the event Mr. Horne started to worry about the 747 that was parked at taxiway F. He coordinated with his staff and United Airlines for a tow of that airplane for a return to the terminal. He also coordinated with customs for Gate 91 use and assisted in the

transfer of passengers from scene to Gate 91 via SFO passenger buses escorted by ASOs. He told ASOs Choy and Magana to go to Gate 91 to assist with clearing passengers.

Mr. Horne had concerns about where to put helicopters on scene and he recommended that they be placed on taxiway C, between taxiways L and P. He said there was also some confusion about what passengers would be transported by helicopter. He believed that, at some point, the decision was made that helicopters were not needed, but they returned to scene later in the event. Mr. Horne said that it appeared to him that there was confusion about who was in charge. He said he was not certain who the Incident Commander was. He elected to seek out those who he knew in police and fire departments and secured information and direction from them.

Later in the event there were questions about opening runways 1R and 1L. At that time he felt there were sufficient ASOs on the field to open the runways. Mr. Horne was concerned with the number of mutual aid vehicles on the airport and the fact that some mutual aid units were being released at their own discretion. After coordination with SFPD and SFFD was complete and barricades were in place at locations to the east of runway 1R, runways 1L and 1R were opened around 1500. Mr. Horne said that airport operations then called him and told him that NTSB had said not to open the runways, so they had to close them again. After a period of time the final decision was made to reopen runways at approximately 1530. His staff continuously performed escorts until around 1800 but around 1600 he called to coordinate crisis counselors for his initial responders. Calls to Gate 91 for ambulances lasted until around 1900. After crisis counseling he returned to scene to conduct another search of the area for missing passengers.

When asked if he had any recommendations based on this experience he stated that he would like to see enhanced reliability of buses. The buses, including the medical buses, were salvage units that needed to be replaced. He also believed that the mobile command post needed upgraded communications. He would also like to see better identification of assignments/responsibilities of personnel on scene. The operations vehicles are natural gas powered and he was concerned about their sustainability and the time it would take to refuel them if the need arose during the crash response. He also talked about the procedures assigned to ASO staff that required them to drive medical buses to scene (buses 291 and 292, which are stocked with mass casualty medical equipment). He believed that the buses were mechanically unreliable and their condition reflected negatively on his staff. He was concerned that his operations vehicles were also not as mechanically reliable as he would like. Finally, he wanted more training for his ASOs in first response if they were going to be the first on scene.

Interview: Mr. John Batkowski, Airfield Safety Officer, San Francisco International Airport (Operations Division)
Date/Time: 09 July 2013, 0935-1115
Location: Administrative Conference Room, Terminal 2, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB), Randy Moseng (FAA)

ASO Batkowski had 4 years of service as an ASO with San Francisco International Airport. He had previously flown commuter airplanes commercially for Mesa Airlines. He and other ASOs¹⁰ heard the Alert 3 tone over the radio as they were finishing a safety meeting where they had been discussing airfield safety and safety response. All of the ASOs immediately exited the meeting room and proceeded to their assigned areas on the airfield. As he exited he looked at a security camera screen and saw the accident site. Initially he thought it might have been a “Redcap” readiness practice drill, which were done about once a month. The tone for a “Redcap” and an Alert 3 are the same beeping sound, while an Alert 1 and Alert 2 use a wailing sound. He heard the tone and waited for the call out that it was a “Redcap” drill. He did not hear the “Redcap” announcement and eventually surmised it was an actual alert. In his opinion this delayed his response very briefly and he recommended that the airport revise these procedures to make actual Alert 3 callouts clearer

ASO Batkowski proceeded to where the Mobile Command Post vehicle was located. He started it and waited for an assignment but did not hear further instructions regarding the use of the Command Post. He got back into his operations vehicle and was driving toward the site when he heard a call about an ambulance near Signature Flight Support that needed an escort so he drove there but did not see ambulance needing assistance. He believed that the ambulance may have been there on another call when the crash occurred and may have followed another vehicle to the scene. He later saw an American Medical Response (AMR - blue and white in color) ambulance on scene that might have been the ambulance that had been at Signature. ASO Batkowski stated that his supervisor, Mr. Brian Horne, had radioed to all ASOs that the airfield was closed, but at least initially Mr. Batkowski made crossing calls to ATC.

He received a call over the radio from ASOs Choy and Esguerra that passengers were evacuating the airplane. He went to bus parking and saw ASO Magana in the white bus waiting for escort. ASO Batkowski escorted the bus down taxiway C and turned right onto taxiway P. They drove to the site where they parked on taxiway F. As they arrived ASO Batkowski saw SFFD conducting firefighting operations. ASO Esguerra was to the north of the airplane and ASO Choy was south of the airplane. He also saw passengers evacuating from the left side of the airplane. He met Mr. Shannon Wilson, Airfield Duty Manager, and they discussed putting passengers on buses and where to take them. They decided that they should take them to the Reflection Room, but that the room had not been set up at that point to receive the passengers. He was concerned that fire vehicles were working around the airplane while passengers were still in the area.

¹⁰ There were 5 ASOs on duty at the time of the accident. ASO Choy had left the meeting early.

As ASOs were already on-scene at the airplane, he decided to drive to the approach ends of runways 28L and 28R to further survey the scene. Upon arrival at the runway approach end areas he surveyed the water and seeing no victims in the water, he radioed this information to dispatch.

At about this time he saw a victim waving at him from the 28L runway near the aiming point marking, approximately 500 feet away, east of the ILS antenna. When he arrived at that location he saw two victims, about 10 feet apart, who were immobile. They were both located on the north side of the centerline of runway 28L. He believed the person furthest west down the runway was deceased with a head injury. There was no movement from that victim. The other victim was lying on her stomach and was conscious, but unable to move. She could only move her head back and forth and could not stand up. She complained about having difficulty breathing and had a head wound. She had bloodied and torn clothing. He initially thought she was a flight attendant, but later realized she was not. ASO Batkowski stayed with the conscious victim, knelt on her left side, held her hand, and prayed with her while he called on the radio for an ambulance to respond immediately to his location. He called for an ambulance numerous times, but did not hear a response. He saw two people walking toward them. One of them had medical experience so he left the conscious victim with him. The other passenger he directed to head away from the 747 parked on taxiway F. During this time he also was directing other passengers on the runway area to move west toward the command post.

ASO Batkowski stated that ambulances began arriving on runway 28R and he radioed to them to slow their approach because there was a lot of debris and possibly victims that needed to be avoided. An ambulance arrived at his location so he continued to look for more injured passengers. He then saw another group of victims waving at him. He moved in their direction, and found a group of three or four people who told him that they had a family member somewhere on the runway. He let them stay in that area and he headed off to search further. A bus was starting to move passengers from the staging area toward the terminal and many more ambulances began arriving. He noted that there were people evacuating the rear of the airplane and that some required medical attention. He said that there were many radio calls made for ambulances. Later, while on taxiway F, ASO Batkowski saw one passenger standing over another passenger who appeared immobile. He called for an ambulance but ended up having to move west to escort an ambulance to the passengers.

ASO Batkowski then escorted an ambulance or two off the field. Upon returning from one trip he noted that airplanes with landing lights on were still on the airfield. He called his supervisor for guidance and then contacted ATC asking to coordinate the escort of the airplanes back to gates. He assisted in escorting a 757 that was in position on runway 1R, a 737 holding short of runway 1R, and two other airplanes that were holding short of the 1/19 parallel runways. ASO Batkowski then discussed getting a 747 a tow. The airplane had been parked at taxiway F, waiting for takeoff at the time of the accident.

When asked how ASO assignments were set, ASO Batkowski stated that there were usually four ASOs on duty on weekends, but on the day of the accident there were five. ASO responsibilities for emergency response were detailed in the emergency procedures manual and they were tested

frequently. The duties normally included one person assigned to North airfield, one to South airfield, one responsible for runways and taxiways, and one person responsible for maintenance duties. The supervisor would often assign a fifth person to wildlife control duty. When asked about normal mutual aid arrival and staging procedures he stated that the entrances, such as the North Field Checkpoint, were normally controlled by police officers while escorts to staging and to scene were controlled by ASOs.

ASO Batkowski said that initially there was white smoke coming from the airplane which changed to black, then back to white while SFFD put agent on the airplane. He never saw any flames although he said he was concerned about an explosion.

When asked if he had any recommendations based on this experience he stated that he questioned the initial discussions that occurred during the event regarding what to do with the passenger buses. ASO Batkowski felt that the use of the buses for passenger transport and control should be better organized in advance of such an event. He added that the medical buses, used to transport mass casualty medical equipment, were well beyond their useful service life and need to be replaced. He said that the buses failed to start initially and this delayed their movement to scene. He stated that after-action reviews at the airport following disaster drills and alerts in the past had not adequately incorporated ASO staff. He also stated that over the past few years he has seen what was in his opinion a degradation of professionalism in the ARFF staff due to the rotation of firefighters from the city to the airport, and back. Finally, in his opinion he felt that an extensive emergency procedures manual review was needed, concentrating on things like how police are trained, etc.

Interview: Mr. Steven Crane, Airfield Safety Officer, San Francisco International Airport (Operations Division)
Date/Time: 09 July 2013, 1140-1248
Location: Administrative Conference Room, Terminal 2, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB), Randy Moseng (FAA)

ASO Crane had approximately 5 years of service as an ASO with San Francisco International Airport. He said he attended San Jose State and had a degree in aviation management and had worked at San Jose and Hayward airports including experience in airport emergency planning. He was assigned to operations maintenance on the day of the accident. He was sitting at lunch with the other Airfield Safety Officers on duty discussing crashes that had happened in the past when they heard the alert for a 777 crash. He could not recall the exact time of the alert but knew it had to be before 1130. He anticipated the alert being called a drill and he waited momentarily for the follow-on transmission of “drill,” which was not forthcoming. He stated that everyone was out of the meeting room within approximately 10-15 seconds.

He proceeded to his vehicle and drove to the North Field Checkpoint. At that point Mr. Crane realized that he had to open construction Gate 82. This was because the existing north field checkpoint had been redesigned recently and the redesign restricted the entry of mutual aid vehicles. He stated that his action in opening Gate 82 was contrary to the existing airfield emergency procedures manual but that he did not care as he believed it had to be done. After opening it a police officer arrived at the checkpoint within 30 seconds to take over security. ASO Crane then left to escort mutual aid vehicles from the north field checkpoint to the staging area near Fire Station 2. There he met briefly with the SFFD staging commander at that site.

As he was beginning an escort of mutual aid units to scene he overheard ASO Batkowski asking for an ambulance. Because fire was on a different frequency from the ASOs the Fire Station 2 staging commander had not heard the call. ASO Crane relayed the call but the staging commander elected to not send an ambulance until he received a call from the incident commander. He heard ASO Batkowski again over the radio, “we need ambulances, we need ambulances, we have criticals, we have criticals.” ASO Crane took the ambulance by his own volition and escorted it and another ambulance down runway 28R and across the infield area to Mr. Batkowski’s location. Upon arriving at ASO Batkowski’s location he saw two victims. One victim was lying face down with her head toward the west, while he believed the other victim to be deceased. She was not being actively treated.

ASO Crane took the same route back to staging at Fire Station 2 and began escorting mutual aid from there to the command post area. He stated he was the only one performing escorts for mutual aid units between the North Field Checkpoint, the staging area, and the command post. ASO Crane said that the command post was to the southwest of the airplane, and that triage was approximately 30 feet from the command post. He was the only person conducting escorts at the time and he concentrated on escorting mutual aid until the call was made that sufficient mutual aid was on scene. ASO Crane then began escorting ambulances out the south field checkpoint.

He said that the American Medical Response (AMR) chief had determined that all ambulances would exit the south field checkpoint.

At that time ASO Crane heard that the control tower was asking for assistance with a California Shock Trauma Air Rescue (CALSTAR) helicopter wanting to land with critical care nurses. ASO Crane said that another ASO assisted the tower and the helicopter landed on 28L. He said that a U.S. Coast Guard helicopter landed within 100 feet of the command post while CALSTAR operated on 28L. ASO Crane said that he performed 6-10 escort trips from the North Field Checkpoint to site with escort convoys consisting of mass casualty units, ladders, engines, paramedics, and others. He stated he was escorting 8 to 10 vehicles at a time. This continued until the staging commander decided enough mutual aid was on-scene.

During this time ASO Crane also escorted three SFO shuttle buses to the scene for passenger transport. ASO Magana had already taken one "old white city bus" to the scene. Some paramedics who had arrived at the airport without transport also went on the buses to the scene. Passengers and victims were transported from the scene on SFO shuttle buses and taken to the "sterile corridor" at Gate 91 in Terminal G. These patients were evaluated and treated as appropriate. He said that patients arrived and were taken up to the "sterile corridor" via an elevator and after being treated, were taken down by elevator and placed in ambulances for further transport off airport. One of the two freight elevators was inoperative. He stated that the use of the Gate 91 area was in the airport emergency plan, but that the further use of the "sterile corridor" was decided on-scene.

There was a request for backboards for the patients at Gate 91. He drove his vehicle to airport operations retrieved two "medical buses," brought them to Gate 91, and unloaded the backboards that were requested. The medical buses contained mass casualty medical equipment, including backboards. The medical buses did not initially start and there was a 15-20 minute delay in their use due to this malfunction. He stayed at Gate 91 to help in directing ambulances, but also traveled to staging at Fire Station 2 to further coordinate ambulances that were arriving and departing. He did not see any delays in ambulances departing the airfield out of South Field Checkpoint. At that time his supervisor, Mr. Brian Horne, elected to pull the ASOs who had been on the initial response and send them to crisis counseling debrief. A call had gone out earlier to all ASOs to return for duty.

When asked if he had any recommendations based on this experience he stated that "Redcap" exercises are done routinely but, in his opinion, they were ineffective because the times for them are known in advance. He felt they need to be made more realistic. ASO Crane also discussed what he called a lack of maintenance on ASO vehicles, particularly the need for new tires on vehicles. It was his opinion that ASOs were "the black sheep" of the airport staff and they were not properly considered or integrated as first responders at the airport. He felt that ASOs needed additional training and equipment as they were often the first to arrive on-scene at accidents and incidents. There was a laminated depiction of where all vehicles are to be in relation to staging. This was only in the command post vehicles and he believed that it should be in a binder in all vehicles with other useful information. Finally, he felt that the control tower did an amazing job.

Interview: Mr. Bernardo Magana, Airfield Safety Officer, San Francisco International Airport (Operations Division)
Date/Time: 11 July 2013, 1422-1535
Location: Administrative Conference Room, Terminal 2, San Francisco International Airport
Representative: Declined
Present: Courtney Liedler (NTSB), Peter Wentz (NTSB), Randy Moseng (FAA), Kathryn Reneau (FAA), Terry Smerdel (SFFD)

ASO Magana had been an airfield safety officer at SFO since December 2010. He stated that an unusual ringtone went off in the office and it was followed by an air traffic controller saying “Alert 3 Asiana 777 crashed at the east end.” He had never heard that tone before – it was a series of fast, repetitive beeps. Shortly after, ASO Choy advised him there were numerous people coming out of the airplane via slide/rafts. As he was going out the door he had asked his supervisor whether or not he wanted him to take one of the emergency buses and he confirmed that he did want him to respond in a bus. He chose the white bus because it had the most carrying capacity and he did not know the scale of the accident. He attempted to start two buses. One bus had trouble starting and he gave up. The other one had trouble as well, but eventually started. They had 5 buses total.¹¹ In his opinion if they had more staff available they would have responded with more equipment, but they had only 5 people on shift so they “just picked and chose what to bring out there.”

He was escorted to the accident site via taxiway C by ASO Batkowski. He crossed runways 1L and 1R to taxiway F (east of N) and turned the bus around to load up the passengers. The bus was facing west. He saw 4 pilots and one flight attendant outside of the airplane and all were ambulatory. One pilot was bleeding from the head. They were in the grass area south of the airplane near where he parked the bus. There were about 20 others behind the airplane in a group with a police officer and several other smaller groups east of the airplane going towards the 747.

He stated that the airplane was on fire and smoke was coming from the other side of the airplane. He stated there were 3 or 4 emergency vehicles west of the airplane. There was an airport duty manager vehicle, a fire SUV, and an ambulance. The ops vehicles had external speakers but not all of them were working at the time of the accident. He said that in the ops truck there is a tower radio and an ops radio. The ops radio can be tuned to the fire frequency. The buses only have an operations channel radio.

He ran out of the bus to the east side of the airplane and directed passengers to the bus. There was a language barrier. Those who spoke English were concerned about their families. Some went to the bus and others started walking toward the United 747 that was on the tarmac. He looked for a way to get their attention and took ASO Esguerra’s truck to about 800 feet from the 747 to get the attention of the passengers. He instructed the passengers on the taxiway to move toward the bus. He saw other passengers who were spread out on the grass and others were walking onto the runway.

¹¹ He stated that there were 4 emergency buses that carried medical equipment such as backboards.

He drove back to the tail of the plane and saw a family of 3 to 4 children and 2 adults. He got the children in the vehicle but the woman could not walk. He helped her get in the vehicle with her husband, drove them to the white bus, and dropped them off. He drove back to the east side of the airplane where he saw a small group of people, an older male, a middle aged woman, and a husband and wife around one injured woman. They were near the ten thousand foot distance remaining marker. He believed that the injured woman was a flight attendant. Her scalp was gone and he saw bare bone. There was blood down her legs and arms and an older man was comforting her. She was unresponsive but breathing so he did not start CPR. The man was frustrated and yelling profanities about how slow the response was. ASO Magana radioed on the operations frequency that he had a critical person on the runway and went to his truck for the first aid kit. The kit was not enough to do any good so he did not even try to use it. He made two additional radio calls stating that he had a critical patient. ASO Batkowski had critically injured victims at the end of the runway also.

One of his co-workers arrived with the red fire truck on 28R. A firefighter observed the critically injured passenger for a few seconds and then started triaging her. He had no medical background so he drove back east of the airplane and found two small children, a girl and a boy. They were with a police officer and the girl could not walk because she sprained her foot. He took them to his truck carrying the girl on his back. He took them over to the bus and dropped them off.

He said he drove the truck back just east to the airplane and gave the truck back to ASO Esguerra. He went back to the bus and called for an Asiana representative for translation assistance. His supervisor went and picked up an Asiana representative and brought him over to the site to tell people to get in the buses and to ask if people were hurt. He got the white passenger bus loaded with uninjured passengers and people with minor injuries. A fire chief brought a firefighter to the bus to give out triage tags. A firefighter triaged all of them as green patients. It took about 5 minutes to go through 40 people.

He made numerous calls about the location of a drop off site. Airport Duty Manager Wilson said to use the transit lounge. He called his supervisor to see if he could drive over there. He said it took several minutes for U.S. Customs to show up and then a few more minutes for them to get ready. Two more blue shuttle buses arrived at triage and he loaded them. All three buses drove over to Gate 91 escorted by ASO Choy and three Customs vehicles and dropped patients at the ramp. He got escorted back to the crash site and discussed unloading the 747 on the radio.

He said that helicopters landed on 28L by taxiway P, he thinks four eventually arrived. He was not aware of any issues with the helicopter operations, but ASO Choy took charge of that. His supervisor told him to help with escorting fire vehicle off the airport. He escorted fire to West Field checkpoint off the AOA. He drove back to the staging area and was asked to wait there for an escort of ambulances. He then escorted paving and ground maintenance and managers to the crash site. He said he escorted the crews that had the restrooms and lights. He said they had 20 to 25 airport operations people on site and he left at 1800.

When asked if he had any recommendations based on this experience he stated that operations personnel were poorly trained for medical assistance and they needed better medical equipment and supplies. He made multiple radio calls about critical patients and the response time was very slow. He heard from his operations colleagues that they had to break protocol because not all mutual aid was cleared by the incident commander to respond to the crash site from staging - some ventured out on their own and ASO Crane helped with escort. ASO Choy brought the truck to him. He knew the airport layout and knew where he was. He stated he had 2 years fire training when he worked at West Chester County airport. He said that he was surprised that the fire was not tackled inside and outside of planes. He said he watched the video and that the fire department vehicles seemed to be blocking the egress areas (slide/rafts) of the airplane. It also seemed that the fire vehicles were not communicating on the north side of the plane for their positioning. One driver next to the wing on the left side of the airplane appeared to have no control of the bumper turret - it was going up and down and up and down. It was the worst control he had ever seen. He stated that he believed SFFD has rotating positions where people cycle through different stations. He thought they should have one dedicated airport crew, similar to what they have at LAX. He stated he had experienced ARFF training at Dallas Fort Worth training and considered it excellent. Finally he said they should reevaluate the emergency response plan for mutual aid.